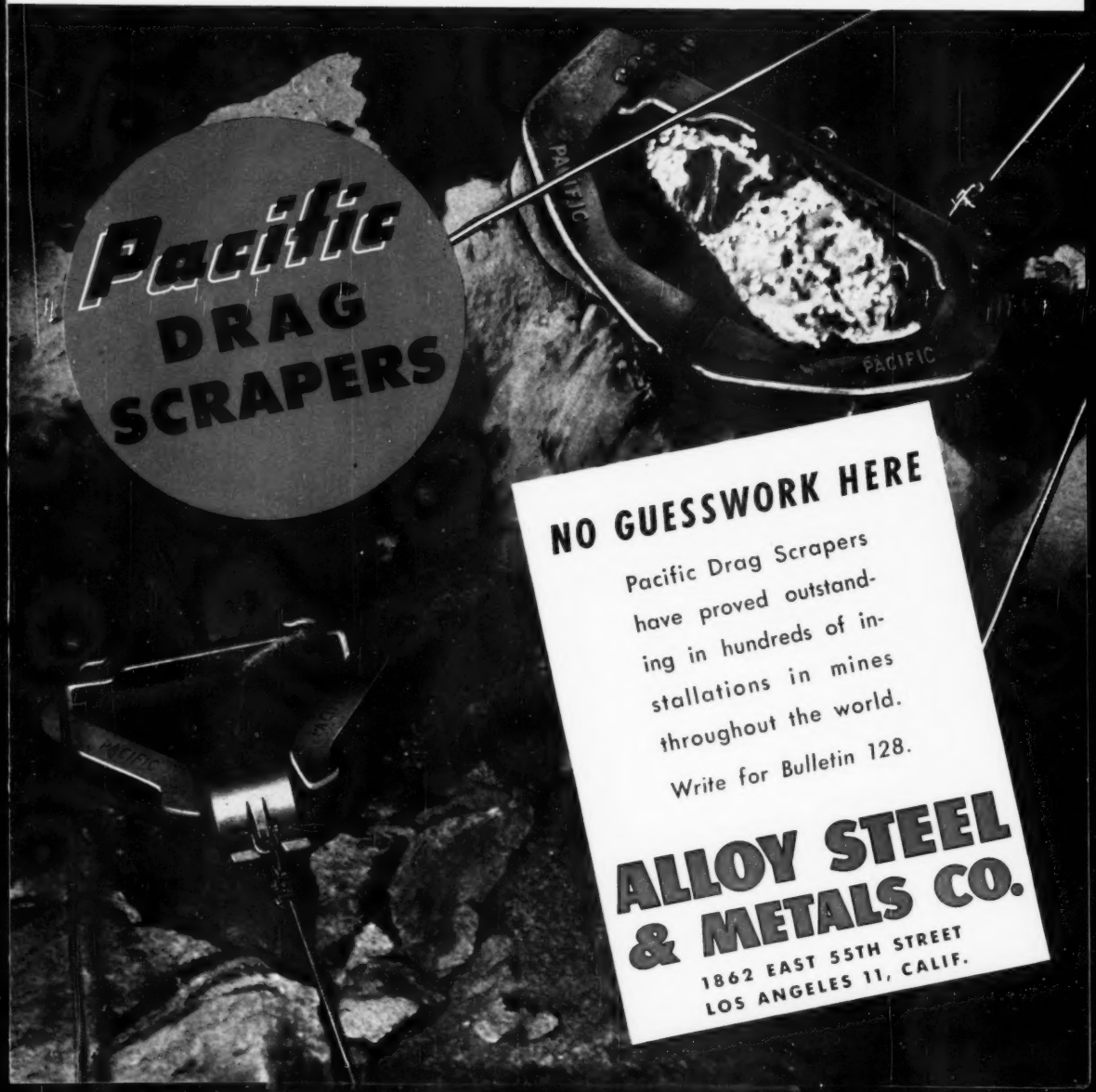
MINING WORLD

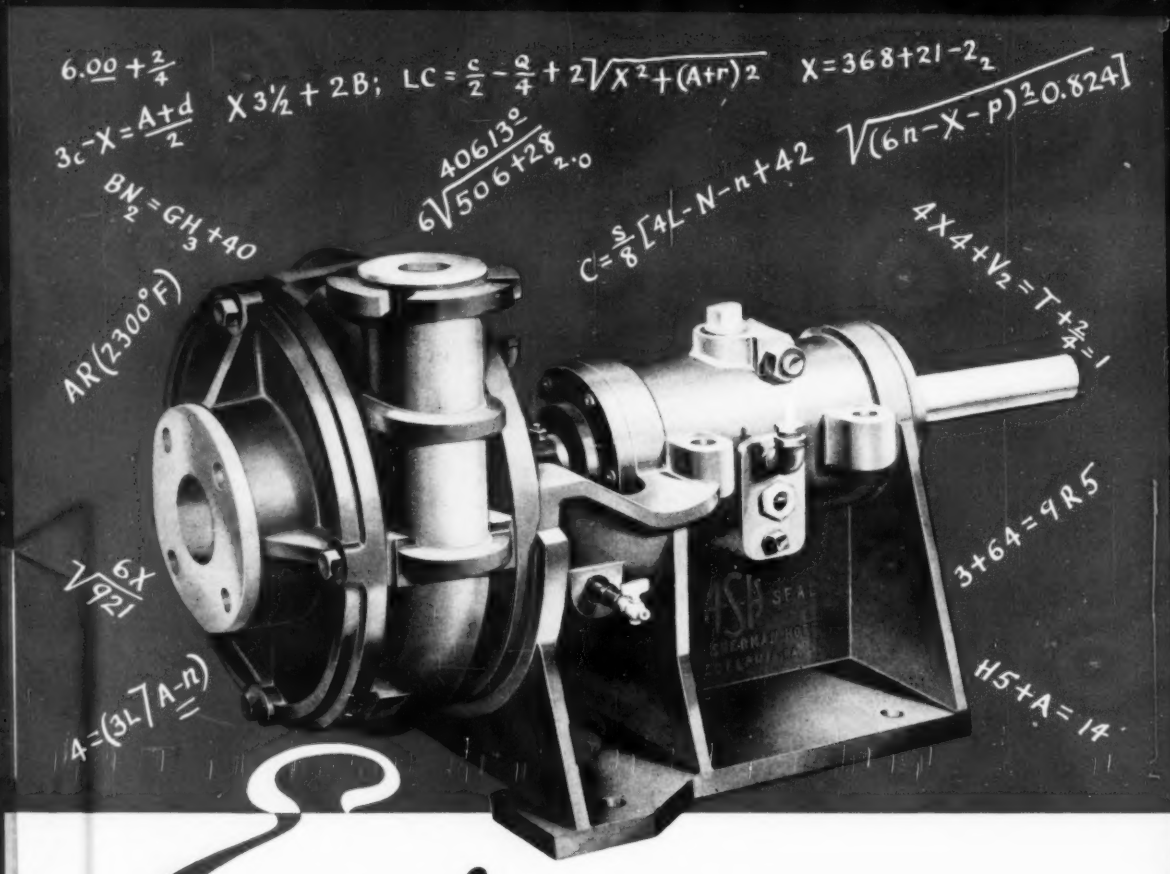
JULY, 1949

VOL. 11 No. 8

35c a Copy

With which is combined THE MINING JOURNAL





Engineers - - -

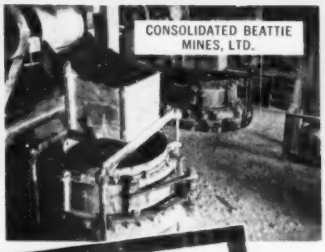
ABRASIVES MATERIALS PUMPING SYSTEMS

Our men do more than sell pumps; they engineer abrasives materials pumping systems and they have 31 standard Hydroseal Pumps to work with, ranging in size from 1½ inch to 14 inch. In addition, they have the knowledge and experience gained from the engineering of many unusual pump applications, as for instance, automatic "capacity-head-speed" control, with which the speed of the Hydroseal Pump varies with changes in volume and/or head. . . . The figures in the blue background above don't mean anything, for frankly, we made them up. But your engineering problems in abrasives pumping have full significance to our engineers. If Hydroseals can't do your job better, our men won't recommend them. But they would like an opportunity to talk it over. Catalog No. 547, sent on request. *The Allen-Sherman-Hoff Company*, 221 S. *15th Street, Philadelphia 2, Pa., U. S. A. Representatives in Most Principal Cities.*

HYDROSEAL SAND, SLURRY & DREDGE PUMPS
MAXIMIX RUBBER PROTECTED

HYDROSEAL, PACKLESS AND MAXIMIX DESIGNS ARE COVERED BY PATENTS AND APPLICATIONS IN THE MAJOR MINING CENTERS OF THE WORLD

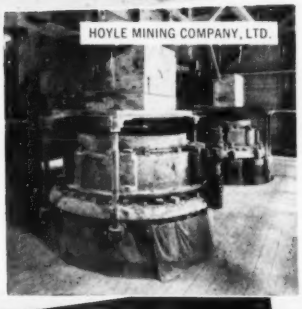
For Big Volume, Fine *Crushing*



Progressive Canadian Mining Companies

use *Symons Cones*

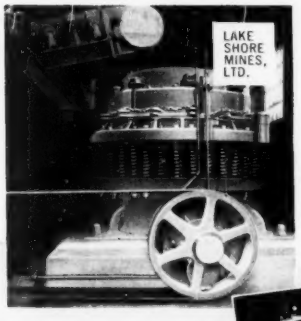
TYPICAL of progressive mines all over the world are these Canadian companies who depend on Symons Cones for their fine crushing. They know from experience that Symons Cones give them big capacity, uniform mill feed and lower costs. Symons Cone Crushers are available in three types—Standard, Short Head and Intermediate — in a wide range of sizes to fit most requirements of feed, finished product and tonnage.



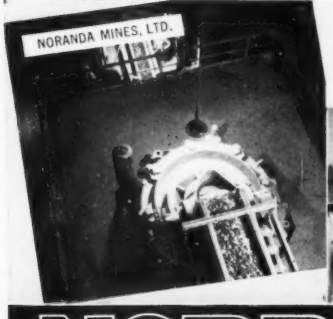
NORDBERG MFG. CO.
MILWAUKEE 7, WISCONSIN

TORONTO OFFICE—
CONCOURSE BUILDING

NEW YORK • SAN FRANCISCO
WASHINGTON • SPOKANE
MEXICO, D. F. • LONDON
TORONTO • JOHANNESBURG



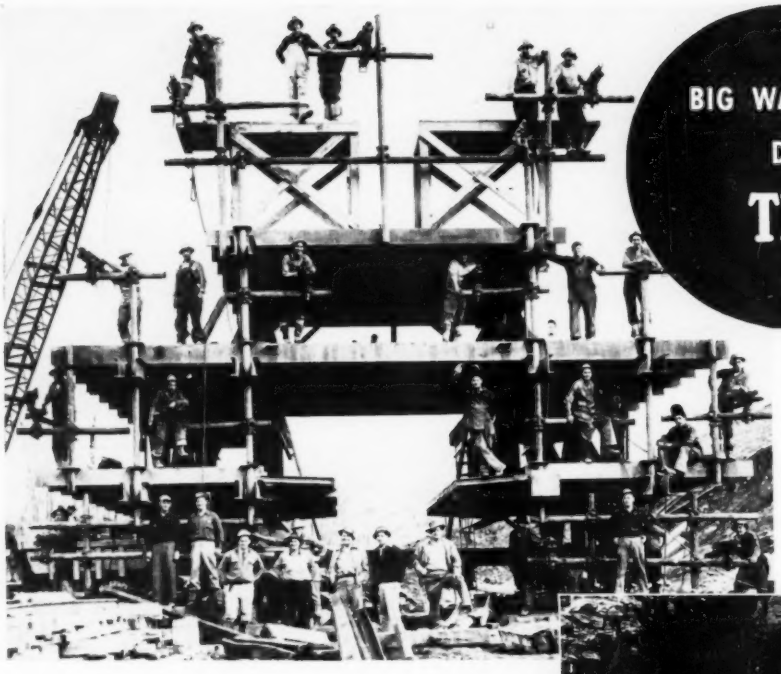
M-649



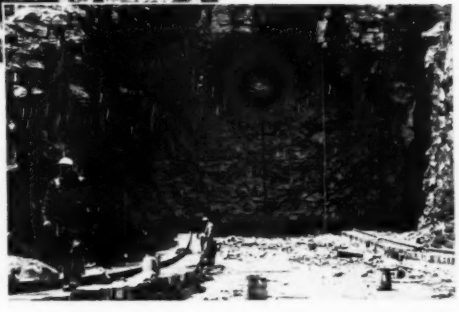
McKENZIE RED LAKE GOLD MINES, LTD.

NORDBERG

Machinery for processing ores and industrial minerals



ANOTHER BIG WATER TUNNEL DRILLED WITH TIMKEN® ROCK BITS



Walsh-Perini Construction Company, Downsville, New York, recently completed the drilling of one of the largest rock tunnels ever constructed — the largest since the construction of the Hoover dam.

This big water diversion tunnel is 2,200 feet long. It is part of a $13,700,510 project to bring water from the East branch of the Delaware river to New York City. 165,000 cubic yards of rock were excavated in the construction of the tunnel.

Top heading was drilled with Timken Rock Bits in Gardner-Denver CF99N Automatic Feed Drifters. The drifters, 20 in number, were mounted on the world's largest jumbo. The 17 ft. bench was drilled with Timken Bits in 8 Gardner-Denver D99D Wagon Drills. In finishing the job within the time set, the contractor has expressed complete satisfaction with the performance and economy of Timken Bits.

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
ROCK BITS

THE TIMKEN ROLLER BEARING COMPANY
Canton 6, Ohio • Cable Address "TIMROSCO"

MINING WORLD, published monthly except in April when publication is semi-monthly, by American Trade Journals, Inc., 121 Second Street, San Francisco 5, California. Entered as second class matter at the post office at San Francisco, California, under Act of March 3, 1879.

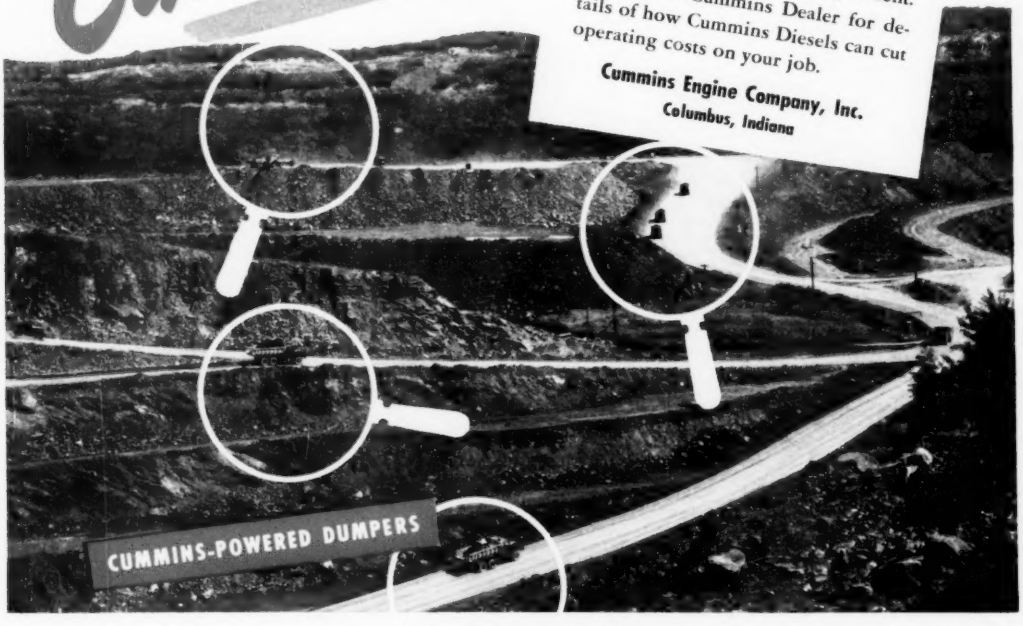
Solved by CUMMINS

In Pennsylvania's Panther Creek Valley, 38 Cummins Diesels powering FCSW64 Mack dumpers are playing a major role in solving the puzzle of successfully recovering coal from a deposit which had once been considered unworkable at a profit.

Hauling from a pit that will reach a 700-foot depth to a dump that will reach a height of 250 feet, the Cummins-Powered Mack dumpers used by Carey, Baxter, Kennedy, Inc., on the Lehigh Navigation Coal Company, Inc., coal stripping job are working 21 hours a day month after month. Typical of the work performed on this job, 34 Cummins-Powered Mack dumpers used on overburden haulage are carrying up to 25-ton loads. Adverse grades average eight per cent.

Ask your Cummins Dealer for details of how Cummins Diesels can cut operating costs on your job.

Cummins Engine Company, Inc.
Columbus, Indiana



SEE YOUR CUMMINS DEALER

CUMMINS SERVICE & SALES . . . . . 1661 McGarry St., Los Angeles, California, Tel. Prospect 1026
WATSON & MEEHAN . . . . . 1960 Folsom St., San Francisco 3, California, Tel. Market 1-8930
CUMMINS INTERMOUNTAIN DIESEL SALES COMPANY . . . . . 1030 Gale St., Salt Lake City 11, Utah, Tel. 9-3768
CUMMINS DIESEL SALES OF OREGON, INC. . . . . . 1225-35 Southeast Grand Ave., Portland 14, Oregon, Tel. EAst 7146
CUMMINS NORTHWEST DIESEL SALES . . . . . 2717 First Ave., South, Seattle 4, Washington, Tel. Main 3870
CUMMINS DIESEL SALES OF SPOKANE . . . . . South 155 Sherman St., Spokane 5, Washington, Tel. Main 5460
CUMMINS & MORAN . . . . . 426 W. Madison, Phoenix, Arizona, Tel. 4-4040
CUMMINS DIESEL SALES OF IDAHO, INC. . . . . . 207 S. Capitol Blvd., Boise, Idaho, Tel. 3783

IS THERE ONE ALL-PURPOSE ROPE?

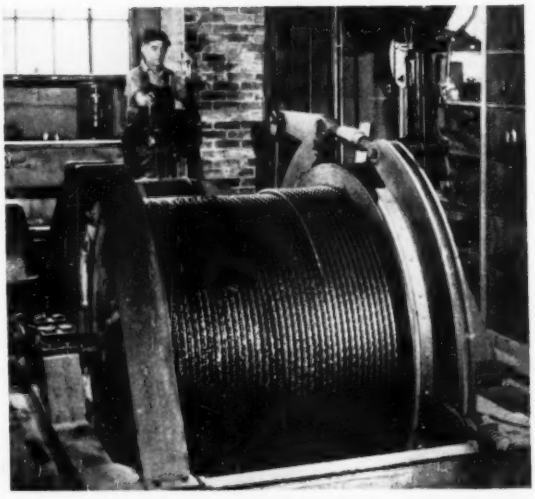
No, because no one rope construction is suitable for every type of job in and around a mine.

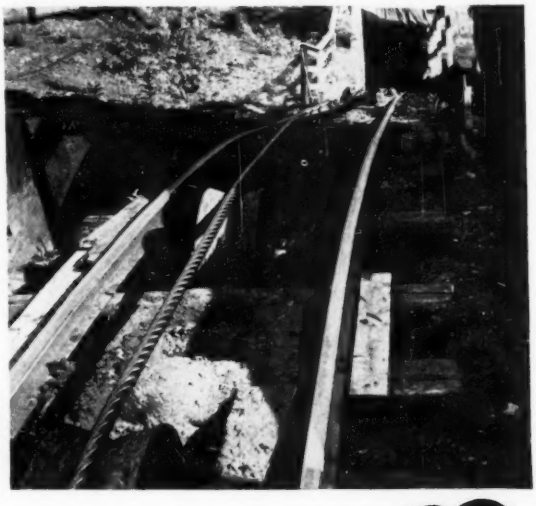
Consider, for example, the two applications shown here. The wire rope on the drum lifts and lowers a shaft hoist. Abrasion is no problem. But the other rope, on a slope job, passes over metal rollers; drags against ties and rocks. Here abrasion is quite a factor, and therefore a different construction is needed.

How are you to know which rope to pick for a given job?

If you aren't sure, the safest thing is to talk with a Bethlehem rope distributor. He'll study the application you have in mind; suggest the grade, type, and size of rope that will give you the best results. His recommendations take full account of local conditions—points that profoundly influence the details of rope design.

And don't forget, if you want help from a Bethlehem distributor, all you have to do is ask. He can save you plenty of headaches . . . and money.





BETHLEHEM PACIFIC COAST STEEL CORPORATION

Sales Offices: San Francisco, Los Angeles, Portland, Seattle, Honolulu

BETHLEHEM PACIFIC

BETHLEHEM WIRE ROPE
BETHLEHEM STEEL

MINING WORLD

with which is combined

THE MINING JOURNAL

A Miller Freeman Publication

Published monthly except in April when publication is semi-monthly

JULY, 1949

VOL. 11 No. 8

SAMPLE LOCATIONS

Capitol Concentrates ... 9
Beating a Lead Oxide Mill Feed ... 10
Recent Production and Productivity of U. S. Non-Ferrous Metal Mines—by Jesse L. Maury ... 15
Ohio City and Gold Creek Mines —by Muriel Sibell Wolle ... 18
Mining Men and Their Activities ... 20

INTERNATIONAL SECTION

International Panorama ... 31
Kenoyer Mine Mechanization ... 36
The Riches of Almaden, Part II —by Laureano Menendez y Puget ... 38
Prominent Men in International Mining ... 44

PUBLISHING OFFICE

San Francisco 5, Calif. ... 121 Second Street
GArfield 1-5887

BRANCH OFFICES

Seattle 4, Wash. ... 71 Columbia St., MAin 1626
Los Angeles 13, Calif. ... 124 W. Fourth St., MUtual 8196
Vancouver, B. C. ... Royal Bank Bldg., MArine 1520
New York 17 ... 370 Lexington Ave., Murray-Hill 3-9295
Chicago ... 4556 N. Paulina, SUnnyside 4-6558

•

GENERAL MANAGER, San Francisco ... M. F. HOLSINGER
EDITOR, San Francisco ... JOHN B. DORSH
ASSOCIATE EDITOR, Vancouver ... CHARLES L. SHAW
NORTHWEST MANAGER ... MILLER FREEMAN, JR.
PRODUCTION MANAGER ... E. B. HERINGTON
EASTERN MANAGER ... KAREL WEGKAMP

Published by
AMERICAN TRADE JOURNALS, INC.
MILLER FREEMAN, President
L. K. SMITH, Vice-President
W. B. FREEMAN, Publisher

Copyright 1949 by American Trade Journals, Inc.

Contents may not be reproduced without permission.

SUBSCRIPTION RATES

U. S., North, South and Central American Countries ... $3.00
Other Countries ... $4.00
Single Copies ... $0.35
Directory Number ... $2.00

Consulting Service For All

A consulting service, available for small and large operators alike, can be had for the price of a penny postcard. The service is the most up-to-date to be had by any individual or company and offers more services in mining, milling and metallurgy and attendant problems than any firm of consulting engineers in the country. It is made up of the suppliers of the industry and their staffs of experts in every department of the mineral industry.

Do you have a problem in drilling? Is it a diamond or percussion drilling problem? Call upon any of the makers of drilling equipment and they will consider your difficulty and send a representative to your property who will show you a way out or direct you to a person who knows the answer. Are you having difficulty in obtaining the proper fragmentation in breaking ground? The services of an explosive expert are yours for the asking. He will study the rock, the charges used and the results obtained and make recommendations that will go far to solve the trouble. Perhaps the powder is too fast or too slow, but whatever the cause the man from the factory puts his finger on the difficulty and leaves the property with a much better fragmentation pattern than before his visit. Perhaps your mill superintendent is having more than a little difficulty with the primary or secondary crusher. Get one of the manufacturers of milling machinery on the wire and discuss the question. If your telephone conversation does not elicit the desired information, an expert will appear at your plant within a matter of days to straighten out the difficulty. Is your classifier bogged down? The same procedure can be resorted to and an answer received that will give you something concrete to rectify the trouble.

In the field of metallurgical research and questions pertaining thereto, the man with a 15 or 20-ton plant receives the same consideration and treatment as the company that is going to put in a 2,500-ton concentrator. Among the supply companies that offer services to prospective customers the only string tied to testing an ore for determining the best flowsheet for its treatment is the request that the company be given preference when the time comes to purchase reagents or machinery.

All of these services can be had without commitment or a fee. The suppliers provide the necessary technician or engineer, the only string attached being that in the event of a sale, consideration be given to their particular line in conjunction with other manufacturers.

Nowhere in the world is such a service offered except in the United States and, to a somewhat limited extent, in Canada. That the industry flourishes to its present degree is due, in large part, to the activities of the suppliers and their representatives. They make up the backbone of engineering skill and knowledge, and have left an impression on the industry that will grow deeper with the passing of time.

★ ★ ★

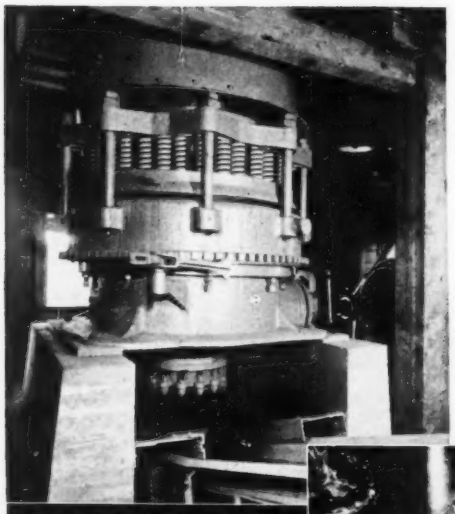
Return to Gold

A logical case exists for the return to a free gold market in this country. Such a market would establish what we really consider the worth of gold and perhaps would pave the way for later convertibility of our paper currency.

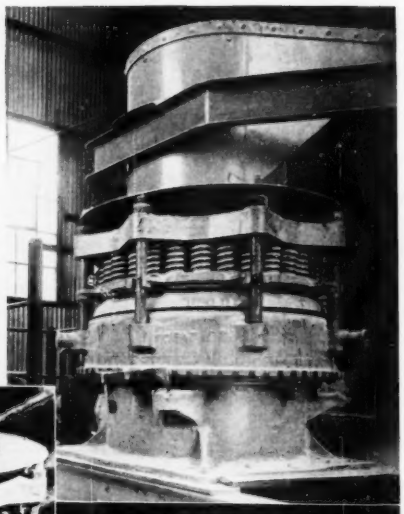
Considerable pressure is now being brought by certain persons in the government in opposition to the illumination that knowledge of the facts of the case and a free gold market might throw on the question. Violent gyrations, they say, would result if the market on gold were opened up and free traffic allowed. They quote with awe the reports of prices paid for gold in some debased foreign currencies, prices that range up to nearly $100 an ounce.

In terms of the currencies for which the gold is bartered, the prices paid mean nothing and the reasoning of the fearful ones in the government not much more.

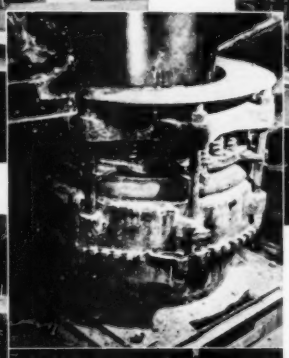
(Continued on Page 7)



UNITED STATES—Snyder Mining Co., Duluth, has 48" Gyrasphere in Virginia Mine, Eveleth, Minn.



SOUTH AFRICA—New Kleinfontein Gold Mining Co., in Benoni, Transvaal, operates a 36" Gyrasphere.



CANADA—Granby Consolidated Mining, Smelting & Power Co., Ltd., Allenby, B.C., has 36" Gyrasphere.

MEXICO—Santa Maria de la Paz y Anexas plant in Matehuala, S.L.P., uses a 24" Gyrasphere.

FINER CRUSHING

ENORMOUS TONNAGE

WIDER RANGE OF SIZES

IMPROVED PRODUCT

CONTINUOUS OPERATION

LOWER UPKEEP

TELSMITH

Gyrasphere SECONDARY CRUSHER

Send for descriptive Bulletin Y-54

MIN-24

SMITH ENGINEERING WORKS, 4034 N. HOLTON ST., MILWAUKEE 12, WISCONSIN

Mine & Smelter Supply Co.
Denver 17, Colo. El Paso, Texas

Mines Eng. & Equip. Co.
San Francisco 4, Calif.

Lee Redman Equip. Co.
Phoenix, Arizona

Garlinghouse Bros.
Los Angeles 21, Calif.

General Machinery Co.
Spokane 1, Wash.

Clyde Equipment Co.
Portland 9, Ore. Seattle 4, Wash.

The Sawtooth Company
Boise, Idaho

Montana Powder & Equip. Co.
Helena and Billings, Mont.

Hamilton Equipment Co.
Salt Lake City 1, Utah

Gordon Russell, Ltd.
Vancouver, B. C.

(Continued from Page 5)

The dollar quotations refer to gold bought with foreign currencies and are calculated in terms of the *official* exchange values of those currencies. These may be from 25 percent to 100 percent over - valued. Therefore, the $75 price for gold that we hear about is more of an indication of the depreciated value of the currency involved than of the value of gold and tells nothing about the value of gold in dollars.

Gold is bought at these seemingly fantastic prices for three reasons. First, lack of confidence in the currencies converted to gold; second, as a means of exporting wealth from soft currency countries; and, third, as a means of acquiring dollars which usually are obtained by circumventing exchange restrictions and export bans so that the negotiators can buy what they want in the United States.

No one of these factors would have the slightest effect whatever on a free gold market in the United States. The primary deterrent to such happenings is our inherent confidence in our own currency and small inducement would be given to bidding up the price of gold. Therefore, as we have dollars that will buy anything anywhere in the world no strong inducement would exist to rush to exchange currency for gold. Last, but not least, the countries now paying inflated prices for gold to obtain dollars would, in effect, be forced away from bidding in our markets because they would have to exchange their currencies for dollars. Once having done that, the advantage of buying gold in our market would be gone.

Further devaluation of the dollar would be a factor in inducing widespread pressure for increasing prices and, at this writing, no indication of such an event is imagined within the foreseeable future, as the dollar already is too cheap in terms of the overvalued world currencies.

★ ★ ★

Alarm Is Unwarranted

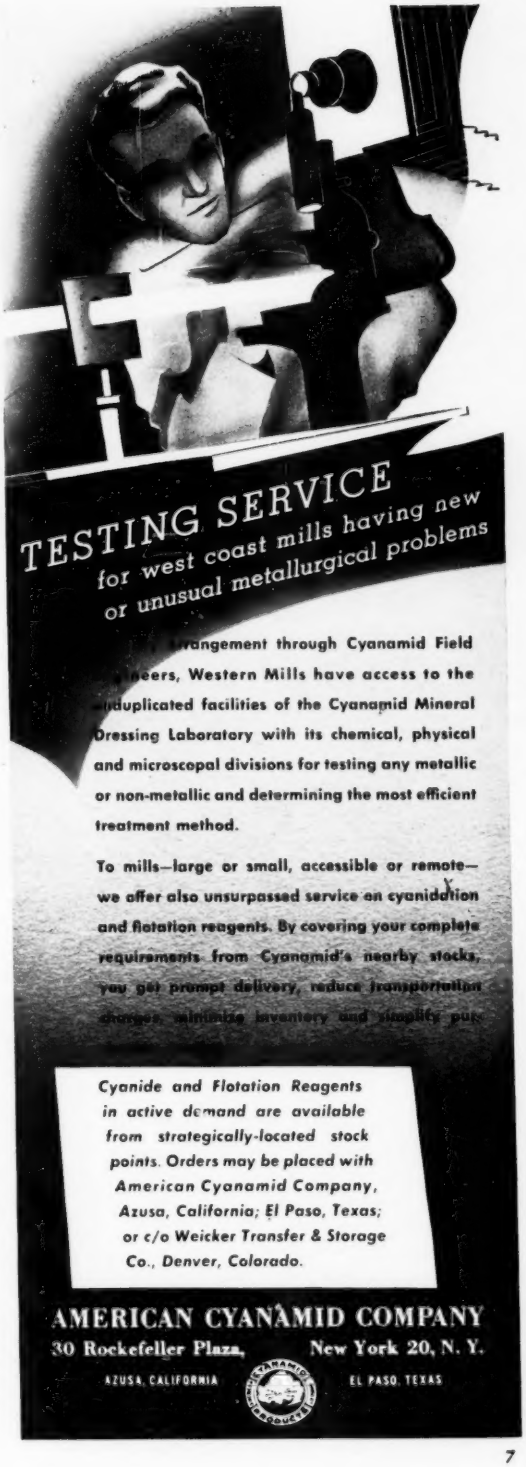
Although metal prices in general have declined sharply over the last three months, due largely to an accumulation of stocks, many observers see no serious cause for alarm over the long run. With the visible supply of metals, both above ground and in disclosed reserves, it is believed that buying in time can catch up with stocks, serving possibly to stabilize prices at somewhat higher levels than prevail at the moment.

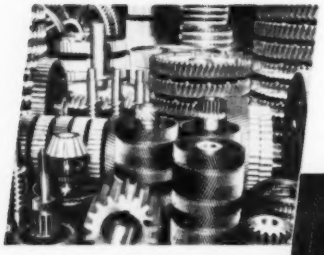
Buyers' resistance, it is true, has sharpened recently, but with the continued demands for automobiles and construction materials, to mention two of the major outlets for metals, it is difficult to imagine a prolonged setback. Demands for other commodities, such as farm machinery, are nearly as sharp as ever and if the public were to decide that prices had reached bottom, normal buying would be resumed and the blight removed from the market with dispatch.

Besides the thinking of the man in the street regarding the so-called slump, Congressional lines of attack are being formed. This is borne out by the talk of reinstating a copper import duty of 2 cents per pound on foreign copper. No doubt, this would act as a cushion for the domestic producer and would revive this branch of the industry more quickly than if the suspension of tax were to run its course until March 31, 1950. On the other hand, a school of thought exists that with reimposing the copper tax, a shortage could exist by fall, depending of course on the revival of the market.

But, regardless of any panacea that may be cooked up for bettering the metal industry, the one factor that will have the greatest bearing on the return to a more normal trade will remain the public's willingness or reluctance to buy, and this will be predicated upon what the public considers the time to begin buying anew.

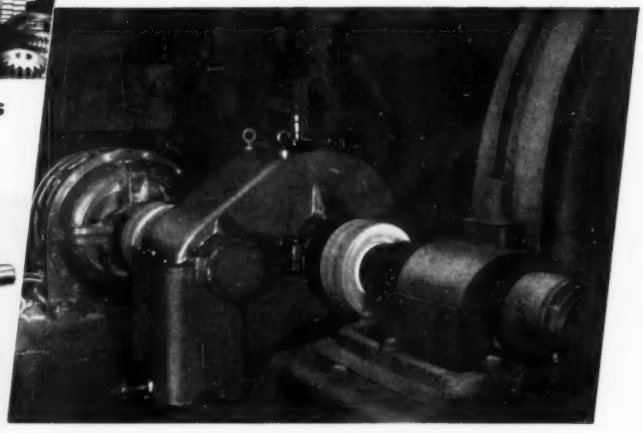
—Ed.


TESTING SERVICE
for west coast mills having new or unusual metallurgical problems
rangement through Cyanamid Field
neers, Western Mills have access to the
duplicated facilities of the Cyanamid Mineral
Dressing Laboratory with its chemical, physical
and microscopal divisions for testing any metallic
or non-metallic and determining the most efficient
treatment method.
To mills—large or small, accessible or remote—
we offer also unsurpassed service on cyanidation
and flotation reagents. By covering your complete
requirements from Cyanamid's nearby stocks,
you get prompt delivery, reduce transportation
charges, minimize inventory and simplify pur
Cyanide and Flotation Reagents in active demand are available from strategically-located stock points. Orders may be placed with American Cyanamid Company, Azusa, California; El Paso, Texas; or c/o Weicker Transfer & Storage Co., Denver, Colorado.
AMERICAN CYANAMID COMPANY
30 Rockefeller Plaza, New York 20, N. Y.
AZUSA, CALIFORNIA
EL PASO, TEXAS



Gears of all types and sizes

A typical mining industry application of Pacific-Western speed reducers is shown in the photograph below of a ball-mill drive.



Single-reduction speed reducer

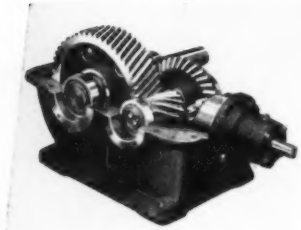
SPEED REDUCERS for every mining need

Fast delivery is now available on many popular sizes of PACIFIC-WESTERN standard reducers from stock.

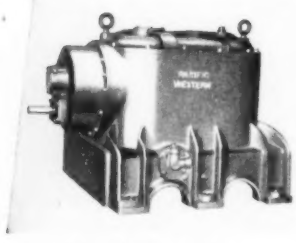
Complete range of ratios from 2:1 to 300:1, capacities from fractional horsepowers up to 650 in standard units; higher horsepower capacities available in special designs. Standard units are available in single, double and triple reductions. Single or double extensions on high and low speed shafts, as well as parallel, right-angle, and vertical-shaft arrangements can be obtained.

GEARS for every need . . . PACIFIC-WESTERN designs and cuts all types and sizes of gears and builds special gear boxes.

COMPLETE engineering service . . . We will be glad to assist you in all your mechanical power transmission needs. Over a half century of gearmaking experience is available to you to help YOU solve YOUR problems.



Right-angle speed reducer



Vertical-shaft speed reducer

Write, wire or phone our nearest plant or office for complete information.

WESTERN GEAR WORKS, Seattle 4, Washington
WESTERN GEAR WORKS, Box 192, Lynwood, California
PACIFIC GEAR & TOOL WORKS, San Francisco 3, California
SALES REPRESENTATIVES: Portland . . . Salt Lake City

AGMA MEMBER

GOOD GEARS FOR OVER 50 YEARS

PACIFIC GEAR & TOOL WORKS ⚙ WESTERN GEAR WORKS

PACIFIC-WESTERN

GEAR PRODUCTS

EQUITABLE TREATMENT OF MINING INDUSTRY ASSURED BY CONTRACT SETTLEMENT BILL

The bill to amend the Contract Settlement Act of 1944 so that mining claimants (now excluded by government agency rulings and actions) may be taken care of passed the House of Representatives May 31 without dissenting argument.

The proponents of the bill point out that the language merely clarifies the Act and that it really permits nothing which the Congress had not intended to be done when the 1944 Act was passed. Nevertheless, industry's experience proved that applications for relief of mining claimants got nowhere. Very soon Senator Murray of Montana, Senator Hayden and Senator McFarland of Arizona, and various representatives, including Representative Engle of California, introduced bills to clarify the original Act and set up machinery to insure equitable treatment of the mining industry.

These bills kicked around the committees year after year and it seemed impossible to get them to a vote. Agency reports on the bills showed the Administration to be unfavorable. Representative Clair Engle, in the meantime, became chairman of the House Public Lands Mining Subcommittee and this position, coupled with an amazing amount of skill and energy, plus a good deal of cooperation from such Congressmen as Michener and Walter, pushed the bill through the tough Rules Committee and to a vote in the House.

It is an interesting fact that after years of effort to bring the bill to the floor, which might lead one to suspect there would be substantial opposition, the House passed it speedily with no dissenting argument. Representative Michener made a most skillful exposition of the reasons for the amendment. A technical amendment was attached by Representative Barrett of Wyoming to prevent interference with any pending litigation.

What the fate of the bill (H. R. 834) will be in the Senate is a question. Senator McCarran's Judiciary Committee failed to report the Senate companion bill introduced by Murray of Montana, and the bill now on the Senate Calendar (S. 528) is an altogether different bill and very unsatisfactory to most people. Although this latter bill has come up for a vote several times, it has been returned to the calendar at the request of Senator Schoeppel of Kansas. In fact, the bill reported by the Senate Judiciary bears no resemblance either to the House bill, or to the bills originally introduced by Senators Murray, Hayden and McCarran, himself. No one around Washington seems to know who is responsible for the new Senate version.

A very difficult situation is thus created which might result in the defeat of the legislation unless Senator McCarran agrees to substitute the House bill on the Senate floor. Meantime, time flies!

● *Unity Is Essential*

It is reported that a few of the larger mining concerns which will need production incentive payments have been playing along with the Interior Department on the supposition that if the department's selective contract scheme could be put through they would be favored with a contract. These people seem to forget that there is no Interior bill before the Congress; that Secretary Krug, in presenting his last draft to Chairman Engle "for discussion," plainly said his plan had no clearance with the government; and that there would be little or no chance of Congress's granting the secretary such arbitrary authority. In addition, the amount of money proposed under the Interior draft is so small that only a few large concerns could be taken care of.

Worrying about a possible presidential veto of H. R. 976 at this time seems not a little strange. If speedy action with full support of the bill by industry is not had within a few days of the publication of this item, there will be nothing at all to worry about—for there will be no bill to send to the President.

As a matter of fact, informed congressional opinion is that the President would be likely to sign H. R. 976 as amended by the Engle subcommittee.

● *Geophysical Claims Act Introduced*

Senator James E. Murray of Montana has reintroduced S. 1793, the "Geological and Geophysical Mining Claims Act of 1947," with a change of date to 1949. The companion measure has been introduced in the House by Representative Walter S. Baring of Nevada. It is presumed that this bill will hereafter be known as the Murray-Baring bill.

Before its first introduction, the bill was 18 months in the drafting stage and two years more have passed without any suggestions reaching Senator Murray which would indicate that the industry desires any serious changes. The subject now is coming into real prominence due to the report of the Hoover Commission which recommended similar changes in the mining laws.

It is reported that the Interior Department and the Krug Industry Advisory Committee (National Minerals Advisory Council) are favorable to the present text.

There is no claim that the bill is perfect—just that so far no one has proposed a better approach. If industry wants such a bill and there is any disagreement about details, early hearings should be demanded and the bill rewritten in the Interior and Insular Affairs Committee to which it has been referred for action. The pros and cons of the situation, together with a detailed analysis of the bill, were printed in Senate Subcommittee Print No. 13, 79th Congress, Second Session, 1947.

(Continued on Page 23)

How Many Grains of Gold Make One Dollar Today?

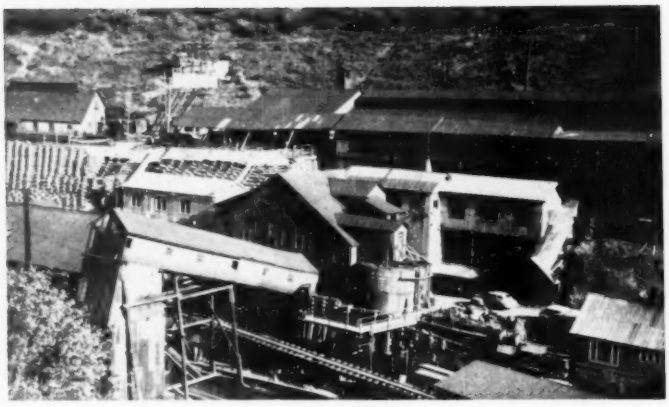
I will endeavor to show by simple arithmetic just what this "must" legislation has done to our money in 15 years.

From 1837 to 1934, the amount of gold constituting $1 was 23.22 grains; and since there are 480 grains in an ounce, simple division shows that this set the price of gold at $20.67 per ounce.

In 1934, the amount of gold constituting $1 was reduced from 23.22 to 13.71 grains; and again by simple division, this gives a price of $35 per ounce for gold.

In 1945, through the enactment of Public Law 84, monetary reserves were lowered from 40 to 25 percent, which resulted in reducing the amount of gold constituting $1 to 8.57 grains; and again by simple arithmetic—divide 480 grains by 8.57 — we find that it requires 56 of these dollars to equal an ounce of gold. Consequently, the price of gold should have been increased to $56 per ounce.

—Hon. John Sanborn of Idaho in the House of Representatives, May 5, 1949.



View of the Sherman mill and Hercules mine shops. Perched in the canyon, space is restricted and part of the buildings are on made terraces as is borne out by the timber lacing at the left.

BEATING A LEAD OXIDE MILL FEED

By a simple rearrangement of the flow sheet, Day Mines, Incorporated, cuts tailing losses materially and contributes to milling knowledge

Described in this article is the method recently employed at the Sherman Mill of the Day Mines, Incorporated, Wallace, Idaho, to recover lead oxide minerals in a mixed mill feed. Athough the method is not entirely satisfactory, tailing losses have been reduced so materially that the management is pleased to air the results in the accompanying report. A comparatively simple rearrangement of the recovery elements in the mill and the addition of Denver flotation cells resulted in the benefits described herewith.—ED.

Faced with the need to reduce tailings losses occasioned by a rather large percentage of oxidized lead minerals, Day Mines, Incorporated, recently added an oxide circuit to the flowsheet of its Sherman mill in the Coeur d'Alene district near Wallace, Idaho. The results, although far from approaching the refinement desired, are considered satisfactory in view of the varying percentages of oxide minerals that enter the mill.

In 1940 the mill machinery was placed in the old rock house of the Hercules mine that was used for crushing and screening in the early days. A great deal of improvision coupled with ingenuity has been needed to adapt the space in the old building to the various elements making up the mill, and the man responsible for the installation and its successful operation is L. A. Grant, mill superintendent for Day Mines, whose duties are distributed among four other company mills besides the Sherman.

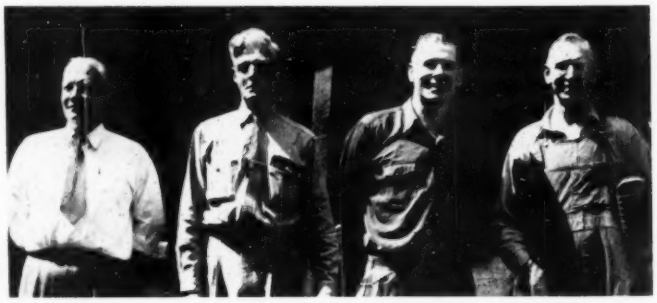
The present capacity of the mill is 300 tons per 24 hours and operations are on a round-the-clock basis, seven days a week. The flowsheet is comparatively simple and the bugs are being worked out gradually with corresponding better recovery and smoother operation.

Plant Economics

The plant as it is today is not the ideal of metallurgical perfection and the recovery leaves much to be desired. However, the plant works and, all items considered, works well, producing with a certain closely controlled set of reagents a steady flow of concentrates of a good head assay value. Furthermore, the plant is a good economic answer in dollars and cents to the problem of winning a fair return in the mill from the supplying mine. Considering that a certain percentage of lead and silver remain in the tailings it can be justified by reporting that the mill is turning out metal that the nation needs for keeping its industrial plant functioning. Also the field for metallurgical research and refinement is open and improvements that can be worked out here may find application in other plants.

Fagregen cells, employed in recovering all lead minerals for some time before the change of flowsheets, are now used in the oxide circuit, and Denver cells were installed for the

Day Mines, Inc., personnel: Henry L. Day, manager; L. A. Grant, mill superintendent; A. J. Almquist, mill foreman; J. H. Rubeke, mechanic.



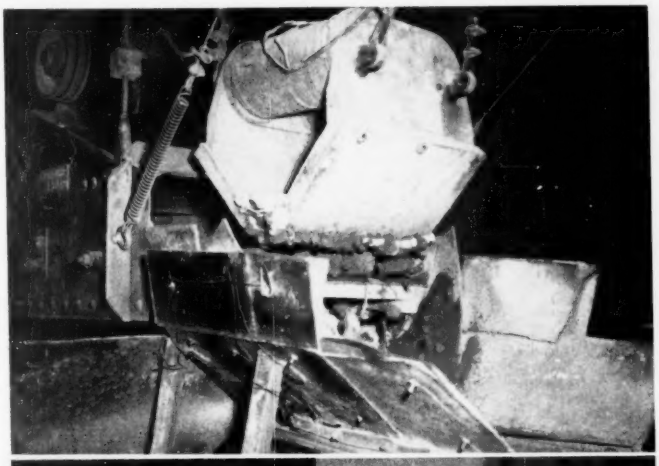
sulphide circuit. The recovery of oxides and sulphides has been gratifying with the present arrangement.

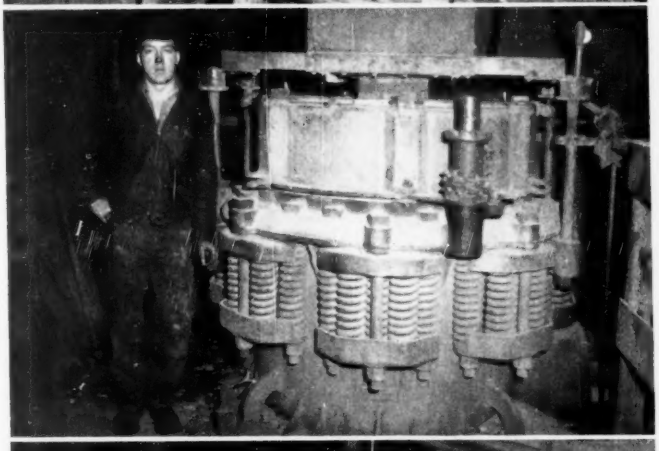
Mineralogy of Ore

The ore is comparatively hard and arrives at the mill in a fairly coarse state, although it crushes readily and grinds without any particular difficulty.

Mineralogically, it is made up of about 11 percent lead. Carried with the lead is an average silver content of 8.5 oz. per ton. Eight units of the metal occurs as galena, the remaining three percent being present as cerrusite, pyrolusite, oxidized galena and various other lead oxides in smaller percentages. Pyrite is present in quantity and is the chief source of trouble in the mill circuit as it floats readily with the lead minerals.

Tailings, before the installation of the oxidized circuit, average 1.6 oz. silver and 2.2 percent lead per ton.





TOP

This shop made magnet, simply constructed and installed, does a good job on picking out the ferrous scrap that comes over the 3x10′ Allis-Chalmers low head screen.

CENTER

Jack Zlencross stands beside the 3′ Symons short head crusher in the Sherman mill. Used for secondary crushing, this machine reduces a feed of 3″ to about ⅝″ without difficulty.

BOTTOM

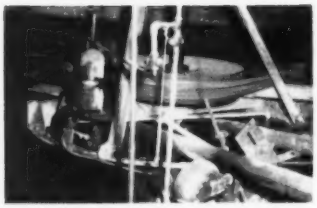
One of a battery of two Power & Mining Machinery Company 7x7′ mills. Originally installed as pebble mills, they later were converted to ball mills and serve well in this capacity.

Since putting in the oxide circuit and under present conditions, the tailing losses run 0.5 oz. silver and 0.65 percent lead per ton, a marked reduction in loss, but still high enough to cause furrowed foreheads among the management.

Concentrates assay 57 percent lead and 45 oz. silver to the ton. As can be seen, this is a high grade lead concentrate and is comparatively clean, the only contaminant in any noticeable percentage being pyrite.

Crushing Plant

Cars of four ton capacity arrive in trains of 10 and discharge directly into a 600 ton coarse ore bin that is capable of supplying the mill for 48 hours should the need arise. The ore passes through a grizzly with 12″ openings. Ordinarily, little of the ore fails to fall through, but from time to time some slight delay is experienced by the need of break large pieces of ore that will not pass. Breaking is then performed by double jack as a rule and occasionally a tough piece of ore drops on the grizzly that requires



Conditioning tank placed at the head of the oxide circuit. The reagents for the circuit are fed into the pulp at this point.

strong methods to reduce to a size that permits passing.

A Coeur d'Alene Hardware Company jaw crusher, 18 x 24", crushes the ore to about 3" size and passes it onto a 3 x 10' Allis-Chalmers low head screen with 1" openings that operates in closed circuit with a 3' standard Symons short head cone crusher which reduces the oversize to about $\frac{5}{8}$" pieces. Material that passes the screen is conveyed to the 200 ton fine ore bin by belt conveyor.

Ferrous tramp material is caught by a magnet placed over the lower end of the screen. This magnet is made in the company shops and works satisfactorily to clean ferrous scrap from the screen discharge. Composed of two coils and impelled by a current of 110 volts, the magnet proper is made of two steel plates 30 x 14 x $2\frac{1}{2}$". Simply made and installed, the magnet requires practically no care and very little upkeep.

Fine Grinding

The fine grinding plant is made up of two 7 x 7' ball mills working in closed circuit with two 8' Dorr classifiers. The ball mills are unusual in that they were manufactured by the Power & Mining Machinery Company as pebble mills and later converted to ball mills and, although many years old, they serve the purpose without incident.

The mills grind the ore unusually well. About 1 percent is retained on a plus 65 screen and 76 percent of it passes minus 200, which speaks well of the friability of the gangue and ore minerals. The overflow from the classifiers is charged to a bank of Denver Equipment Company flotation cells, underflow returning to the ball mills for regrinding.

As the ore is rather hard and quite abrasive, the wear in the ball mills is rather excessive. The average duty of the grinding balls is about 3 lb. of cast iron balls per ton of ore. On the other hand, the wear on the liners averages about 0.5 lb. per ton more or less.

To show the habit of the finely ground ore, surveys conducted by the metallurgical staff of Day Mines show that the classifier circulating load approaches 350 percent, a rather high figure when all factors are considered.

Sulphide Circuit

As the flowsheet logically is broken into two parts to recover sulphide and oxide minerals, the first mention will be made of the sulphide circuit. The overflow from the classifiers, properly conditioned, goes to a bank of six 54" Denver Equipment Company cells. Conditioners and reagents are added in the ball mills in the following amounts per ton: Soda ash as an alkalizer, 1.5 lb.; potassium cyanide, used as an iron depressant, 0.1 lb.; Minerec, the sulphide collector, 0.056 lbs.; and B-23 Dupont, 0.02 lb., employed as a frother. Flotation results are good in this circuit. The bubbles are of good texture and the froth bright and lead colored.

The resulting flotation product is cleaner than might be expected. Frothing is good and very small percentage of oxide minerals come over. The concentrates are put over two Oliver filters, 8 x 4' and 8 x 6', respectively, after which they are dewatered in a 20 x 10' tank and conveyed to the concentrate storage bin to await shipment to the smelter.

Oxide Circuit

The pulp, or sulphide tailings, after treatment in the sulphide circuit, passes into the oxide circuit by way of a conditioning tank. In this tank a number of reagents are added, each of which plays an important part in the metallurgy of the plant. As the pulp contains silver as well as lead in the form of oxides and carbonates, it must be dressed properly to obtain the best possible recovery. It should be emphasized that research is going on constantly to improve the recovery and what is considered workable practice today may be discarded tomorrow in favor of some other innovation or trick that will save a fraction of the losses going over the tail races.

Reagents Employed

The list of reagents utilized in the oxide circuit is made up of ordinary chemicals and their amounts and uses in the circuit follows: Cresylic acid, employed as a frother, 0.13 lb.; lime, an alkalizer, 0.03 lb.; Z-6, for collecting lead, 0.09 lb.; Z-3, also a lead collector, 0.06 lb.; sodium sulphate, used as a sulphidizer for coating carbonates of lead, 1.6 lb.; and thyrocarbonalide, of value as a silver collector, 0.16 lb.

Oxide flotation cells are of Fagregen manufacture. Five 56" cells make up the rougher circuit, using as pulp the tailings of the Denver cells in the sulphide circuit. In these cells the pulp gets a thorough conditioning and the float product is collected and sent to the cleaner oxide circuit which consists of one 42" Fagregen cell, the rejected waste going to the tailing pond. This cell, although somewhat smaller than the rougher cells, nevertheless gives excellent results. The expectancy naturally is that one small

Left: These Fagregen flotation cells, manufactured by the Western Machinery Company, make an oxide lead concentrate. Right: The bubbles shown in this picture range up to 12" in diameter. While this is not good flotation practice it nevertheless illustrates the capabilities of the Fagregen cell when treating problem ores.

cell will not handle the collected concentrates from five larger cells, but no difficulty is met with in accomplishing this. Concentrates are sent to the same 20 x 10′ settling tank that handles the sulphide circuit product, afterwards going to the two Oliver filters mentioned in connection with the treatment of the sulphide concentrates. A belt conveyor carries the concentrates from both circuits to the concentrate bins where they await railroad transportation to the smelter.

Operating Knowledge Important

Strange results sometimes are obtained in the oxide rougher cells. Owing to the radical change in mineralogical composition, sometimes taking place within a space of two or three minutes, flotation bubbles may vary from a small brittle type to great flabby sacks of air up to 10 or 12″ in diameter. The mill operators endeavor to keep the bubble size down but this is not always possible considering the radical variance in composition of the ore from different working places and the length of time required to change the reagent control. One of the most important factors in the economical operation of this particular mill is experienced supervisors and operators coupled with a knowledge of the physical and chemical characteristics of the ore.

As has been indicated heretofore in this article, oxides of lead in the flowsheet of the Sherman mill have a high nuisance value, causing constant adjustments of the reagents and various units making up the recovery circuit. The supply of lead minerals amenable to treatment by the method described above is limited, and definitely to be considered in the future is the change over to a flowsheet that will treat an ore with high oxide content. When this day comes, thought has been given already to going to a fatty acid float with a strong frothing reagent to recover the lead values.

Regarding the silver that occurs in fairly constant ratio to lead in both classes of ore, laboratory tests indicate at this date that tabling may be resorted to in order to recover the metal in greater degree.

A battery of Denver flotation cells in action in the Sherman mill. These are used in sulphide circuit.

Conclusions

In summarizing the lesson taught by the experience of the Sherman mill, the following major points stand out:

1. Tailing losses of lead and silver were cut by approximately two-thirds.

2. This was accomplished by utilizing the equipment in the mill and by adding six Denver flotation cells.

3. Close control of the ore must be maintained because of its constituents.

4. Supervisors and operators must be familiar with the ore for best results.

Table No. 1

REAGENTS EMPLOYED IN THE SHERMAN MILL

Reagent	Where Added	Amount	Use
Soda ash	Ball Mill	1.5 lb.	Alkalizer
KCN	Ball Mill	0.1 lb.	Iron depressant
Minerec	Ball Mill	0.056 lb.	Sulphide collector
B-23 Dupont	Ball Mill	0.02 lb.	Frother
Cresylic acid	Mixing Tank	0.13 lb.	Frother
Lime	Mixing Tank	0.03 lb.	Alkalizer
Z-6	Mixing Tank	0.09 lb.	Collector
Z-3	Mixing Tank	0.06 lb.	Collector
Thyrocarbonalide	Mixing Tank	0.16 lb.	Silver collector
Sodium sulphide	Mixing Tank	1.6 lb.	Sulphidizer (coats carbonate minerals)

Canadian Firm Urges End Of Copper-Nickel Tariff

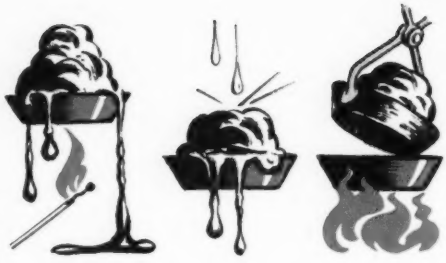
Permanent removal of United States tariffs on Canadian copper and nickel was urged by Robert C. Stanley of New York, chairman of the board, International Nickel Co. of Canada, Ltd., at the annual meeting in Toronto recently.

"The tariff on copper imports (2 cents a pound) continues as a handicap against Canadian producers, preventing the effective development of outlets for Canadian copper in the United States market," said Mr. Stanley.

"The copper tariff has been suspended temporarily, but should be removed permanently from the United States statute books for the mutual benefit of American consumers and Canadian producers. The remaining 1¼ cents a pound United States duty on refined nickel is also a trade obstacle which we must strive to have removed, particularly since the United States is dependent on Canada as the source of supply for this strategic metal."

The company's world sales of nickel in all forms in 1948 were 240,098,274 pounds, compared with 205,278,868 pounds in 1947.

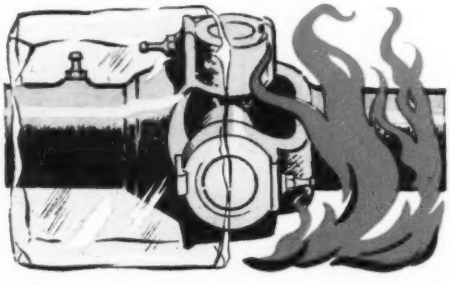
SAVE TIME–CUT COSTS with MULTI-PURPOSE UNOBA GREASE!



1. Prior to Union Oil Company's development of multi-purpose UNOBA, practically the only greases available were made with sodium, calcium and aluminum bases. Calcium base grease is water-resistant but has a low melting point. Sodium base resists heat but doesn't stay put in the presence of moisture. Aluminum base withstands water but jells at high temperatures.

2. There was an obvious need for an all-around grease that would resist *both* heat and water. Union Oil Company's development of UNOBA—a *barium* base grease—filled this need for the first time in history. As a result, multi-purpose UNOBA is in demand for a great number of uses in all branches ot industry.

3. For example, trucks and automobiles formerly required a half-dozen or more lubricants for a single lube job. Now these specialized greases are replaced by UNOBA—one grease for the entire job. Industrial plants find that UNOBA simplifies lubrication by performing jobs formerly requiring many different types, grades and brands of greases.



4. UNOBA gives thorough protection at temperatures from below freezing to 300° F. It sticks to metal surfaces with a tenacity that boiling water can't break. Because of these qualities, industry has found multi-purpose UNOBA to be the ideal lubricant. For UNOBA saves time and cuts costs by simplifying lubrication and gives the greatest possible protection in the presence of extreme heat or heavy moisture.

For full information phone your local Union Oil Representative or write Sales Department, Union Oil Company, 617 W. Seventh St., Los Angeles 14, Calif.

ANOTHER

UNION OIL

SUCCESS-TESTED

PRODUCT

RECENT PRODUCTION AND PRODUCTIVITY OF UNITED STATES NON-FERROUS METAL MINES

With metal prices in flux, the following article by a man who has specialized in mining economics and costs comes at an opportune time. Mr. Maury is well known in Washington circles and has had wide experience in the industry and his paper may reflect some of the trends that can be expected in the forthcoming months. Certainly, the accompanying tables and charts point up valuable data for operators, consumers and government officials alike and offer a gauge that should prove of value in projecting possible producing ability of the mining industry in the future.—ED.

By Jesse L. Maury

Mining Engineer

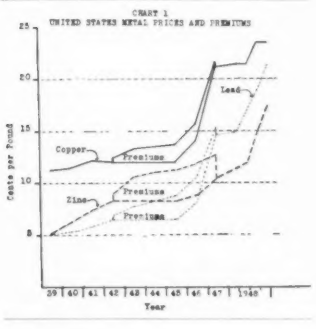
Chevy Chase, Maryland

Sufficient facts have now come into the record so that a fair perspective can be had of the performance of our copper, lead and zinc mines under the imperatives of war and during, preceding and succeeding the adjustment periods. Reasonably complete figures for the period 1939 through 1948 have either been published by the U. S. Bureau of Mines or are available there in preliminary form. Unless otherwise noted, all of the data in this discussion are from the Bureau. I am responsible for their arrangement and interpretation.

Prices

Production is best viewed in its price framework. Chart No. 1 reviews the price movements 1939 through 1947 by years and by quarters in 1948, the latter my own approximations of the quarterly averages.

Under the stimulus of coming war and heavy consumer demand, prices rose from the lows of the thirties to late 1941-early 1942, when ceilings were set. In early 1942, premiums to marginal mines were instituted. Chart and table show these premiums as additions to the prices of the total metal output. Prices remained stable, with slowly rising premiums, until the early summer of 1946. Between then and mid-1947, price increases for copper and lead brought those prices to heights sufficient to facilitate all but the last small part of marginal production, and premiums declined correspondingly. Shortly after premiums ended in mid-1947, zinc prices began to rise.



Copper and zinc price increases during 1948 appear to have been in response to pressure from independent copper mines and Tri-State producers; an example of the classical rule that in a seller's market prices are determined by marginal costs of production.

JESSE L. MAURY, author of article.

If rumor can be trusted, the impulse to higher lead prices in 1948 has come from the more speculative elements in the industry, scrap dealers and custom smelters.

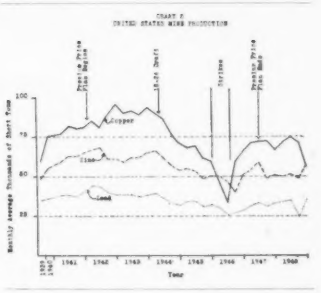
Mine Production of Metal

The Bureau computes monthly figures of domestic mine production in terms of estimated recoverable metal. These figures are available 1941 to date. Chart No. 2 shows these in terms of monthly averages by calendar quarters, the last quarter of 1948 estimated. The chart also shows monthly averages for the years 1939 and 1940.

With the ample labor reservoir of the late thirties, the price stimulus was able to bring rapidly increasing production from 1939 to peaks:

Lead	Early 1942
Zinc	Mid-1942
Copper	Late 1942

Employment data for copper mines indicate that a peak labor force was maintained through 1943. Similar data for lead-zinc mines are available only in a mixed form, and do not yield a definite conclusion. My own impression is that the lead-zinc mine labor force had suffered substantial decline by late 1943.



All mine production was well maintained to early 1944. At that time the emphasis of war output had shifted to agricultural and end products, and the 18-26-year-old draft was allowed to strike mercilessly at mine labor forces.

From then until the end of the long strikes and price adjustments of 1946, the record is one of frantic improvisation by management, cutbacks in exploration and development, growing arrears in maintenance and repairs, and a dreary, irresistible decline in output.

By mid-1947, the mines had regained production rates about the 1939-40 level. In spite of unlimited demand and rising prices, wartime peaks could not be repeated. Short labor supply and the arrearages of previous forced production were probably the limiting factors.

The ending of premiums in mid-1947 had no noticeable effect on copper or lead production. Zinc production dropped at once by some 8 or 9 thousand tons a month, all in the Central States, mostly in the Tri-State. During 1948, other producing areas made up a little of this deficiency. It appears probable that the last increase in zinc prices, to 17½c for Prime Western, may have restored much Tri-State output in the last months of 1948.

Local, but important, strikes crippled lead and copper production in the last half of 1948, while a somewhat smaller strike reduced zinc production slightly.

Mine Production of Ore

The Bureau reports annually the different types of ore mined in the United States. These data are summarized in Charts Nos. 3 and 4.

Table No. 1

UNITED STATES MINE EMPLOYMENT
(Millions of man-days)
AND
PRODUCTIVITY

Type of Mine	*1939*	*1940*	*1941*	*1942*	*1943*	*1944*	*1945*	*1946*	*1947*
Miss. Valley lead-zinc	1.57	1.75	2.05	2.64					
Lead-zinc lode					5.72	4.87	4.27	4.17	4.45
Gold-silver lode	9.12	9.20	8.81	5.99	1.04	0.69	1.16	1.17	1.49
Total, except copper	10.69	10.96	10.86	8.63	6.76	5.56	5.43	5.34	5.94
Less Tri-St. tails 65	0.11	0.13	0.16	0.15	0.17	0.18	0.17	0.15	0.09
Lode, except copper	10.58	10.83	10.70	8.48	6.59	5.38	5.26	5.19	5.85
Copper	5.02	6.15	6.94	7.55	7.59	5.94	4.44	3.74	4.94
		TONS ORE PER MAN-DAY							
Lode, except copper	3.48	3.57	3.74	4.37	4.75	5.42	5.52	5.20	5.08
Lead-zinc lode					4.00	5.01	5.15	4.62	4.38
Copper	11.00	11.30	11.30	12.20	13.00	15.40	17.50	16.70	17.70
		POUNDS METAL PER MAN-DAY							
Lead-zinc lode					354	412	375	342	308
Copper	286	295	278	287	288	337	348	326	342

To get a clear picture of lead-zinc mine production, I have felt it advisable to eliminate the Tri-State tailings, which yielded a huge tonnage of very low grade material. The calculations are shown in the table.

Copper ores rose from 55 million tons in 1939 to 98 million in 1943, declined to mid-1946, and rose again to 88 million in 1947.

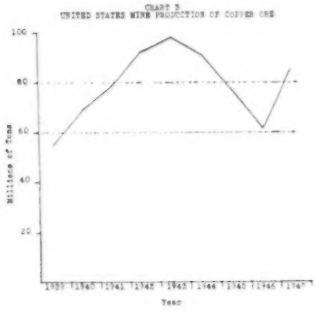
Dry and siliceous ores (gold and silver) declined steadily from a peak of 19 million tons in 1939 to 2 million in 1945, and rose slowly to 4 million in 1947. It would appear that the gold order of October, 1942, merely accelerated a process which was already in full swing.

Lead, zinc, and complex ores rose from 17 million tons in 1939 to 27 million in 1945, declined in 1946, and rose again to 26 million in 1947.

Statistics record the elimination of Tri-State tailings from lead-zinc recoverable metal production, copper recoverable metal production, and recoverable grades of ores.

Grade of copper ore declined steadily from 1.3% in 1939-40 to minus 1% in 1947.

Combined lead-zinc grade declined with one interruption from 5½% to 3½%.



So far as can be observed, these declines were facilitated equally well by either premiums in the order of 2c to 3c or price increases in the order of 6c to 8c.

Employment

Respecting copper mines, the Bureau publishes a series of employment data which are comparable for our entire period and for many years prior. These are recorded in Table No. 1.

Lead-zinc mine data are available as such only for 1943 and subsequently. Prior to 1943, Mississippi Valley lead-zinc mines were carried as one group. A second group, gold-silver lode mines, included lead-zinc mines outside the Mississippi Valley. We can, therefore, derive figures for the total lode mines other than copper for the entire period, but for lead-zinc mines only for 1943 and subsequently. These are shown in Table No. 1.

A minor correction is assumed for Tri-State tailings on the basis of 65 tons per man-day.

Copper mine employment rose steadily from 5 million man-days in 1939 to 7½ million in 1942-43, declined to 3¾ million in 1946, and rose to 5 million in 1947.

Total lode mines (excluding copper) declined from some 10¾ million man-days in 1939-41 to 5½ million in 1946, and rose to 6 million in 1947.

Lead-zinc mines declined from 5¾ million man-days in 1943 to 4 million in 1946, and rose to 4½ million in 1947.

Productivity

Productivity may be considered either from the management viewpoint of ore output per man-day or the economic view—point of metal output per man-day. Both are shown in Table No. 1 and Charts Nos. 7 and 8.

Copper mines show a fairly steady increase from 11 to 17½ tons of ore per man-day during the period. Pounds copper per man-day stopped at around 290 through 1943, rose precipitately to some 340 pounds in 1944, remaining there through 1947.

No such clear picture is available for lead-zinc mines. We can derive a statistical series for the entire period for all lode mines (except copper). In its first four years, however, it is one-half to one-third gold-silver ores, and in later years almost all lead-zinc mines. Representing as it does the elimination of such mines as Alaska-Juneau, Homestake, Grass Valley, Mother Lode, and Sunshine, we might assume that as to ore productivity it is fairly homogenous. That is, those mines probably approximate in productivity the other part of the group, which is about one-fourth Southeast Missouri, one-third Tri-State, and five-twelfths Eastern and Western lodes. The series is of dubious value, though, and while I have listed and charted it, I make no further comment.

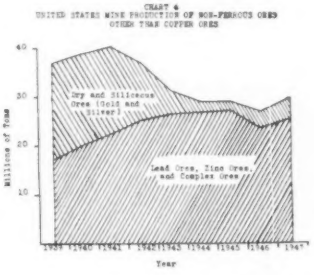
Ore productivity at lead-zinc mines proper can be calculated only for 1943 and subsequently. This rose from 4 tons per man-day in 1943 to 5 in 1944-45, and declined to 4.4 in 1947. Data have been published showing that during this period Southeastern Missouri mines declined in ore productivity by about one-third, recovering partially in the last year. This would indicate that at other lead-zinc mines ore productivity made even more substantial gains than the total figures show. The general conclusion is in accord with the statement often made that tons per man-day doubled in the Tri-State during this period.

Metal productivity rose from 354 pounds of lead-zinc per man-day in 1943 to 412 in 1944 and declined steadily to 308 in 1947.

Explanation of these changes in productivity involve a good deal of speculation.

As to ore and metal, the sharp increases in 1944 seem linked with the sharp decline in the labor force. Faced with the necessity for production, management was probably able for a while to defer all but production work and make emergency use of labor in an all-out effort.

The massive operations of the copper pits seem to be enabling them to retain their wartime gains in efficiency, probably through near-capacity operations. Probably also, the



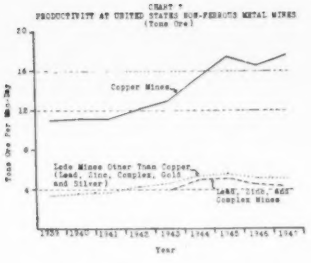


CHART 7
PRODUCTIVITY AT UNITED STATES NON-FERROUS METAL MINES
(Tons Ore)
Tons Ore Per Man-Day
Copper Mines
Lode Mines Other Than Copper (Lead, Zinc, Complex, Gold and Silver)
Lead, Zinc, and Complex Mines
1939 1940 1941 1942 1943 1944 1945 1946 1947
Year

release from selective to mass-mining, first by premiums and then by high prices, has played a part in the increased productivity of caving and vein mines. The notable technical advances at Butte since the early forties presumably have some weight in the upward trend.

The downward trend in lead-zinc ore-grade however, indicates the extent to which mass-mining may have contributed in increasing ore-productivity. The interplay of mass-mining and extensive mechanization in the Tri-State probably accounts for almost all of the remarkable increases in ore productivity in that district.

In the closing years of the period, lead-zinc mines appear to be losing some of their gains in ore productivity. Being exclusively underground mines, this may represent the application of labor to exploration and development previously deferred.

Metal productivity has declined markedly in the lead-zinc mines, evi-

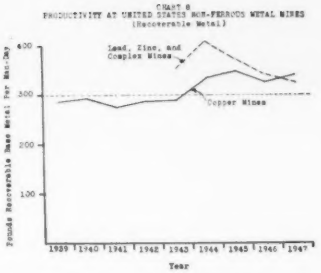


CHART 8
PRODUCTIVITY AT UNITED STATES NON-FERROUS METAL MINES
(Recoverable Metal)
Pounds Recoverable Base Metal Per Man-Day
Lead, Zinc, and Complex Mines
Copper Mines
1939 1940 1941 1942 1943 1944 1945 1946 1947
Year

dently a function of declining grade of ore. Since this probably indicates thorough extraction, facilitated by premiums and high prices, it would appear to be a long-range gain for the country and the industry.

SOUTHWEST URANIUM MINING ACTIVITIES WITH SPECIAL EMPHASIS ON ARIZONA DEVELOPMENTS

Approximately 200 tons of uranium ore are being mined daily from deposits on the Navajo Indian Reservation in northeastern Arizona. The project is being carried out by the Vanadium Corporation of America under contract with the Atomic Energy Commission.

The extent of the uranium program in Arizona was reported by Charles H. Dunning, director of the Arizona Department of Mineral Resources, Phoenix, following a tour of inspection to the Arizona properties and to the AEC uranium plants in Colorado and Utah.

Dunning reported that the production of uranium ore is coming from five separate locations on the Navajo Reservation, all of which are open-pit operations. These are located as follows: 23 miles south of Mexican Hat, Utah; three miles west of Carrizo, Arizona; 12 miles west of Carrizo; 5 miles north of Redrock, Arizona, and 14 miles west of Redrock at Cove Mesa. Three of the developments are small, but the one south of Mexican Hat and the one north of Redrock are quite large. In addition, the Vanadium Corporation of America has acquired more than 30 other locations or leases within the Navajo Reservation.

Dunning also reported that the Atomic Energy Commission is laying plans for an extensive diamond drilling program in 1951 on the Navajo Reservation, but that, so far, the exact location is confidential. The probable procedure, he said, will be to withdraw the land, then drill to locate the deposits, and finally to turn them over for private development.

The uranium program is seen as a partial solution to the Navajo Indian problem since 10 percent of the income obtained from sale of the uranium ore is turned over to the Navajo tribal fund. On the basis of present production of 200 tons daily, at $50 a ton, it means a profit to the tribe of about $1,000 daily.

"Our survey of the entire area shows a great expansion in proved deposits, together with enormous future possibilities," Dunning said.

Four uranium processing plants are now in operation. These are located at Monticello, Utah, and at Durango, Nautrita and Uravan, all in Colorado. They are treating 500 tons of ore daily, 250 tons of which comes from deposits within Colorado, the only state which exceeds Arizona in uranium production at present.

A fifth reduction plant is under construction at Hite, Utah, on the Colorado River. It is being erected by the Vanadium Corporation of America, and is designed to receive and process the copper-uranium type of ore.

During May several other uranium strikes were reported in Arizona. Among these are discoveries by Clare Pearson of Fredonia and Pete Micklebach of Flagstaff. The latter discovery is in the district south of Holbrook in the Chinle formation, and Micklebach has located 31 claims. In this instance, as at the Baker discovery in the Vermilion Cliffs country, the uranium occurs in petrified wood. Preliminary sampling indicates a 4 to 5 percent uranium content. The Pearson deposit, the exact location of which has not been made public pending perfection of locations, is said to have produced samples running as high as 10 percent uranium.

At the Vermilion Cliffs, Mr. and Riley Baker have established a camp, acquired burros, built a trail, and are packing ore from the deposit to the camp site, preparatory to shipping to the processing plant at Monticello, Utah. Truck shipments will be routed through Winslow, Arizona; Gallup, New Mexico, and Dove Creek, Colorado, a distance of about 500 miles.

Getchell Reports Good Progress on New Mill

Good progress is reported by Getchell Mine, Inc., which is installing new equipment for its contemplated 1,500-ton daily capacity mill in the Potosi district of Humboldt County, Nevada. Mining and milling of the oxide ore is continuing at the rate of about 300 tons daily and will continue as long as this operation does not interfere with the expansion program.

At the latest report, the crushing plant, with the primary and secondary breakers, heavy pan feeders, conveyors and screening plant, was about 80 percent complete, and excavations were being readied for the concrete and installation of two 200′ traction thickeners. Removal of equipment in the present mill building has also been under way to make room for cyaniding and flotation equipment.

The new flow sheet includes replacing the primary and secondary crushers, screening plant, enlarging fine ore bins, rod milling, followed by fine grinding with flotation of the sulphide and concentration of the gold-carrying minerals.

The gold concentrates will be combined with the sand portion of the pulp for oxide roasting and, finally, cyanidation of the calcines with a resultant dore bullion from precipitates which will be shipped to the mint. Arsenic sulphide concentrates, free of gold, will be stockpiled awaiting a suitable market or for treatment.

Muriel Sibell Wolle describes

OHIO CITY AND GOLD CREEK MINES

Prospectors driven by gold fever worked their way up Ohio Creek, 21 miles northeast of Gunnison, in 1860 and 1861 and discovered placer gold in the streambed. Some of them pitched their tents on German Flats and continued their search, and others combed the nearby gulches until, rumor says, 2,500 men were scattered throughout the vicinity, but their discoveries were not sensational and before long they left for richer diggings. Except for sporadic prospecting, Ohio Creek was neglected until 1879 and 1880.

Then, during the great silver rush that followed the Leadville and Aspen booms, when eager men scrambled over the Continental Divide and pushed their way up the streams on the western slope of Colorado, Ohio Creek was again the scene of prospecting. These miners were searching for silver and their efforts were rewarded by the discovery of a number of lode mines whose ore was heavy with that metal.

Early in the spring of 1880 a town, known at first as Eagle City, was laid out at the junction of Ohio and Quartz creeks and in less than two weeks 30 to 50 log cabins and tents and a few frame buildings bristled over the flats beside the two streams. Pitkin, another mining camp six miles to the east, was booming, too, having gotten a slight head start on Eagle City, and from it came most of the dressed lumber from which certain stores and cabins were built. But since the cost of this lumber was high, building lagged in Eagle City until June, when a sawmill was set up only two miles away, and, once started, the whine of its saw could be heard night and day.

By 1881 a dozen buildings, a hotel, several restaurants and saloons, assay offices, real estate offices, blacksmith shops, and a sprinkling of cabins and tents served the population of 100, and men continued to pour into the little camp on the daily stage from Pitkin (fare ninety cents).

Chicago capitalists invested heavily in town lots, and financed the construction of several commercial buildings within the townsite. Everyone was hunting for the valuable ores which were claimed to be nearby, but which were as yet only "prospects," awaiting development.

The camp's name was soon changed to Ohio City, because of its proximity to Ohio Creek, and all through the eighties and early nineties it continued to grow and prosper and its mines to produce satisfactorily. Silver flowed from the mines and the mills hummed with activity.

In 1893, when the bottom dropped out of silver, Ohio City was hard hit, but, fortunately, in the late nineties gold was discovered at several places in a large area known as the Gunnison Gold Belt, and eager and optimistic men began searching for what they hoped would become a second Cripple Creek in wealth.

By 1896, Ohio Creek was searched for a third time and gold in appreciable amounts was found. Thereupon the creek was renamed Gold Creek and a new boom brought life back to Ohio City. The Gold Brick Mining District was formed, embracing a portion of the Quartz Creek District and covering 20 square miles, all of which was rich gold territory.

Sketch of the Raymond mine on Gold Creek, near Ohio City. The mines of this camp had more than the usual number of ups and downs during the life of the diggings.

Assessment work was done on 50 claims, several mines which showed returns of from $50 to $150 a ton were worked, and the timber close to the town and along the creek began to disappear, as it was felled for mine timbers and for shafthouses and mills. More than once forest fires further depleted the timber in the vicinity and threatened the lives of hundreds of prospectors along Ohio Creek.

A daily stage ran up Gold Creek to the mines and a railroad, the Denver South Park & Pacific, ran through the town on its way to Parlin, where it joined the Denver & Rio Grande main line, thereby facilitating the shipment of ore from the mines and mills.

According to a newspaper account, "There may be in Colorado a mining camp with brighter prospects than Ohio City, but if so the writer has not heard of it. . . . The city was recently incorporated and is rapidly achieving city airs." Not only did mining bring men to the little city, but good trout fishing in the streams and lakes at the head of Gold Creek and good camp sites were dangled as bait to prospective visitors.

With gold mining so well established, the town settled down to a life of its own. A Sunday school was established and the "honorable school board had the interior of the schoolhouse put in fine order by the artistic hand of Prof. Chris Jackson." In winter the tinkle of sleigh bells was heard above the "already crowded hustle-bustle of our noisy streets." . . . "Ohio City is all right, but with one exception," wrote the editor of a Gunnison paper: "If that bawl-mouthed Link Ball was out of camp, peace, harmony, and Christian love and sunshine would reign supreme!"

The principal mines in the Gold Creek and Gold Brick mining districts were not close to the city, but were up Gold Creek several miles, and were found in micaceous slate or schists. The ores were uncovered at considerable depths and were not satisfactorily worked except through tunnels. Gold was found in all the properties worked, with minor values of silver, lead and zinc ore present.

The road to the mines climbs slowly but steadily up the valley through which the stream cuts, past the Dakota, Western Hemisphere, Ontario, Brooklyn Girl and Clara lodes. In 1945, I drove from Pitkin to Ohio City and up Gold Creek to look for several old mills which I was told were still standing. After a three-and-a-half-mile drive, the road

passes the first big property—the Carter Mine.

The 79 patented claims in this group included several good producers, the Volunteer, Ohio, and Irene. The property was developed by a tunnel a mile and a half long which was driven until it reached a point directly under the old Volunteer shaft. During the years when the mine was running to capacity it always met its payroll and bills and, therefore, had excellent credit in the county and state. Its plant was modern and its mill one of the finest.

Immense amounts of money were expended in its development, but the mine "paid off" by being a steady gold producer ever since about 1900. Carter and his son planned the development of the mine, supervising the extension of the tunnel and paid expenses by taking out only the ore that was in the way of the tunnel's progress. In addition, the owners ran drifts 200' in all directions and found enough additional ore to run a 20 stamp mill for 20 years. During one period of its development the mine produced a gold brick worth $3,000 every two weeks. With the government order to shut down gold mines in October, 1942, the mine suspended operations, only to reopen in 1946 under new ownership and with a new mill designed to treat 125 tons of ore per day.

A mile farther up the creek is a tiny lake in which is mirrored a group of red mine buildings. This is the Raymond mine, the pioneer of the section, and up to the death of its manager some years ago, one of the most active. Its 600 acres of mineral land was developed by a tunnel 2,700' long, which cut a number of veins in its course and opened up new orebodies at a depth of 1,000'. Although it produced over $7,000,000, after the loss of its manager it closed down. In 1916 it was for sale or lease.

In 1946 it was reopened by the Ore & Chemical Company of Ohio City and its tunnel was driven still farther into the mountain to intersect a diamond drill bore which the Burleson Mines Company, the former operators, had begun. New machinery was installed in the old stamp mill by the present owners.

Another mile farther up Gold Creek is the Gold Links property, whose 40-stamp mill was the biggest in the gulch. Beyond the mill are other company buildings—a big two-story bunkhouse and a number of smaller shops and sheds. According to one old-timer to whom I talked, the Links was a "rental proposition." It has seen a good deal of development and at one time had a force of 200 men at work. It is said to have produced more silver than gold.

The Links property consisted of 6,000 acres of mineral ground extending from Gold Creek eastward and including such good properties as the Sacramento, Silver Islet and Fairview lodes. The property, like all those on the creek, was developed by a tunnel 4,000' long, from which a million dollars' worth of ore was mined. After the closing of the gold mines in 1942, the company operating the property switched from gold to copper mining and proceeded to work, but on a small scale.

Just beyond the Gold Links is the Belzora-Bassick property which extends on both sides of the creek. Above it is the Sandy Hook, but its mill was dismantled some years ago and its machinery installed in the Roosevelt mine on Quartz Creek, between Ohio City and Pitkin. Adjoining the Sandy Hook and the Belzora-Bassick property is the Frances mine, the last big property up the creek. Since there were no more mines and mills to find, I drove slowly back down the creek road to Ohio City again. Very few people live in the tiny community, and I tried to picture the place as it must have looked in 1907, when it was said to have "withstood hard times better than any other camp in the county" and to have been "a mining camp on a paying basis."

On the way back to Pitkin I passed the Roosevelt mine with its modern buildings and mill (to which the Sandy Hook machinery was transferred) and I listened to the noise and clatter of an active mine—so different from the silence of some of the mills I had just seen.

DETACHABLE BITS
HOT MILLING

- **We will hot mill, re-temper and harden the popular types and sizes of rock bits.**
- **We re-shank, re-thread, and re-condition any type, size, or length of Drill Steel.**
- **We manufacture and maintain a complete stock of new drill rods, gads, chisels, spades, and all other tools used in Pneumatic Paving Breakers or Jack Hammers.**

For Rent

Large and small portable air compressors, paving breakers, jack hammers, chipping hammers, pneumatic tools, and air hose.

We specialize in concrete cutting and demolition work.

EMSCO
AIR HOSE COUPLINGS

Dependable, Prompt Service

Phone or write
FOR PRICE SCHEDULES

EMSCO CONCRETE CUTTING COMPANY

2751 East Eleventh Street • Los Angeles 23, California

AN 3-4151

MINING MEN AND THEIR ACTIVITIES

About men who are well known and prominent in American metal mining circles

Dr. Philip J. Shenon, consulting geologist and mining engineer of Spokane, Washington, has been made head of the department of mining at the University of Utah. Dr. Shenon is chairman of the Mining Geology Committee of the American Institute of Mining and Metallurgical Engineers and is a member of the Canadian Institute of Mining and Metallurgy. He is also a member of the Society of Economic Geologists and a Fellow of the Geological Society of America.

Harry Harbeck and *Julius Johnson* have retired from Homestake Mining Company, Lead, South Dakota. Harbeck, a mine department employee, had been at the company 26 years, and Johnson, metallurgical department employee, was 34 years at the company.

T. P. Billings, manager of western mines, United States Smelting Refining and Mining Company, Salt Lake City, Utah, has been made consulting mining engineer for the company, where he has worked since 1929. *Arch G. Kirkland*, assistant manager of mines, who takes Mr. Billings' place as manager, has had considerable experience in Canadian mines, including the managing of Mic Mac Mines, Ltd., a subsidiary of U. S. Smelting.

DR. WILLIAM B. MATHER, nationally known economic geologist, has been appointed chairman of Mineral Technology at Southwest Research Institute, Houston and San Antonio, Texas.

Jeanne Mullinix has become associated with the mining firm of Rowe, Gabelic and Buehler as secretary. The company's name as of June 1 was changed to Rowe, Mullinix and Buehler, as Miss Gabelic has resigned. Extensive quartz and placer claims are held by the company in southern California.

Harrison V. Combs, 71, of Clifton, Arizona, has retired from active work after nearly a half-century of employment in the Arizona copper mining industry. Combs arrived in Clifton in 1900 and immediately went to work for the old Arizona Copper Mining Company. He continued with Phelps Dodge when that company purchased the property in 1921. For many years Combs was in charge of maintaining the water supply system for the mine.

R. J. Kilgour is now manager of the Camray operations at Theano Point on Lake Superior and has resigned his position as manager at Starratt Olsen Gold Mines, Ltd., Madsen, Ontario.

F. C. Lendrum has become the mill superintendent at Anacon Lead Mines, Ltd., Portneuf County, Quebec. He had been research metallurgist at Normetal Mining Corporation, Ltd., Quebec.

Henry L. Hill resigned his position as mine manager of Reeves MacDonald Mines, Vancouver, British Columbia.

L. F. Labow is now manager for Starratt Olsen Gold Mines, Madsen, Ontario, and leaves his former job as chief mine engineer at Hallnor Mines, Ltd., Pamour, Ontario.

W. L. Anderson, who resigned from Emperius Mining Company, Creede, Colorado, last fall, is now general superintendent for the Vanadium Corporation of America at Durango, Colorado.

R. W. Lauterwasser has been elected to the board of directors of the Central Eureka Mining Company by the stockholders in a recent San Francisco meeting. He is also chairman of the governing board of the San Francisco Mining Exchange.

J. M. McDonald, mining engineer of Seattle, is now in charge of operations for Silver Crescent, Inc., Wallace, Idaho. A 1913 graduate of the University of Washington, McDonald has devoted the majority of his career to mining operations in Canada and Alaska, where he had been developing his own gold property for the past two years.

Arthur A. Booth, Northwest mining engineer and long-time resident of the Coeur d'Alenes and Spokane, is now making his headquarters at 1039 East Ocean Boulevard, Long Beach 12, California.

Richard H. Wesley is now a partner in the firm of Wesley, Bedford and Stickels, consulting geological engineers, with headquarters at 2370 Penobscott Building, Detroit 26, Michigan.

Gilbert Frayser, formerly chemist for Fluorspar, Inc., at Salida, Colorado, recently accepted the position of chemist-assayer for the Emperius Mining Company, one of Colorado's large silver producers at Creede.

A. S. Walter, consulting mining and metallurgical engineer of Socorro, New Mexico, was recently appointed to fill a vacancy on the board of directors of the New Mexico Society of Professional Engineers. Walter was formerly dean of mining and metallurgy at the New Mexico School of Mines, where he taught for 22 years.

Russell W. Mumford has been appointed vice-president in charge of technical operations for the American Potash & Chemical Corporation, according to a recent announcement by President *Peter Colefax*. Succeeding *Samuel Cottrell*, who resigned, Mumford has been with the company since 1920 and is credited with having contributed substantially to the development of the chemical production process used at the American Potash plant at Trona, California.

P. N. Pitcher has been made mine engineer at Giant Yellowknife Gold *Mines, Ltd.'s*, operations in the Northwest Territories. Pitcher has had experience at Cariboo Gold Quartz and Utica Mine in the Slocan.

Thomas F. Kearns was re-elected president of Silver King Coalition Mines Company, Salt Lake City, Utah. Other appointments include *James Ivers*, vice-president and general manager; *M. G. Heitzman*, manager of operations, and *S. B. Lamkin*, secretary - treasurer. Stockholders last month elected as directors: *J. F. Fitzpatrick*, *Jay T. Harris*, *W. J. O'Connor*, *D. J. Pope*, *W. R. Landwehr*, *David Keith*, *Jr.*, and other officers.

Charles Ogee is now handling all crushing work, ore haulage and employment at the National Lead Company's barite property 30 miles north of Dunphy, Nevada. Ogee has been employed at the Getchell mine in the Potosi District.

Starr Hill, Jr., has been appointed as mining engineer at the mine safety field office of the U. S. Bureau of Mines, Phoenix, Arizona. Hill is a graduate of the University of Nevada and prior to his affiliation with the

PROFESSOR WALTER H. PARKER retired in June from his position as head of the mining department at the University of Minnesota after 30 years service. He is a member of A.I.M.E., I. of M. & M. of London among numerous other societies.

Bureau was employed at various Nevada properties.

J. H. Pascoe has been appointed by the State Mining Board at Olympia, Washington, representative of management. *Harry Boyle* is coal mining engineers' representative and *Thomas Walmsley* has been reappointed representative of practical coal miners.

Dr. A. H. Lang is on a trip into the Arctic and Northwest Territory of Canada. He is connected with the Geological Survey of Canada.

Compton I. White, Jr., was elected president of Whitedelf Mining and Development Company, Clark Fork, Idaho. *W. W. Von Canon* is vice-president and *Compton I. White, Sr.*, is secretary-treasurer.

Raymond G. Foote, assistant treasurer at Oliver Iron Mining Company, Duluth, Minnesota, has retired after 48 years' service. *Raymond L. Larson* has become treasurer and *Arthur L. Anderson* is now assistant treasurer. Larson has been with the company since 1912 and Anderson since 1907. *Thomas J. Trewartha* has been appointed works accounting supervisor, and *John J. Specht, Jr.*, becomes chief clerk at Oliver's Canisteo district operations.

Harvey Glover has been appointed mill superintendent for Copper Canyon Mining Company at Battle Mountain, Nevada. Glover was formerly mill superintendent for Mountain City Copper Company and was associated recently with the International Smelting and Refining Company, Toole, Utah.

Ernest H. Carlson has been re-elected president of the Maple Lead Gold Mining Company which is developing the Porcupine group of claims three miles from Ymir, British Columbia. Also re-elected were L. G. Candler, vice-president; L. O. Smith, secretary-treasurer, and William Curts, director.

R. V. Porritt has been promoted from assistant manager to manager at Noranda Mines, Ltd., Quebec, Canada. *C. E. Anderson*, who was manager at the Porcupine Mines, Ltd., has joined Noranda as assistant manager.

S. A. Mahon, Jr., Hibbing, Minnesota, has been appointed superintendent of the M. A. Hanna Company's Weggum iron mine, operating on the Mesabi range.

O. W. Tuckwood, formerly general traffic manager for American Smelting and Refining Company, New York, has been made vice-president in charge of traffic. Tuckwood has been active in transportation and mining circles for some years and has served as chairman of the Lead Producers Traffic committee.

C. F. Kelly, Robert E. Ewyer and *E. Roland Harriman* were recently elected directors for the coming three-year term by the Anaconda Copper Mining Company, Butte, Montana.

R. R. Estill, general superintendent of the United States Coal and Coke Company, Mexico, Kentucky, has announced the appointment of *John R. Drenan* as superintendent of the Fluorspar Division.

L. E. Griffith has moved from Oskaloosa, Iowa, to Enis, Montana, to be in the vicinity of his dredging properties which are expected to be tested soon. He is also locating some ground suitable for drag-line, to be leased out or operated himself next year.

E. T. Stannard, president of the Kennecott Copper Corporation for the past 18 years, will retire at the end of the year, to be succeeded by *Arthur D. Storke*, now president of the Climax Molybdenum Corporation. Stannard will remain with the corporation as a director and consultant. Kennecott's new president joined Climax in 1917, served in World War I and rejoined the organization in 1926 when he was sent to South Africa as general superintendent for American Metal Company, Ltd., a large Climax stockholder. The following year, he became managing director of the Mufulira and Roan Antelope copper properties in Rhodesia, partly owned by American Metal. During World War II, Storke resigned to act as minerals adviser to Britain's Ministry of Supply, re-

Satisfaction for customers and ability to meet all operating requirements is the record that Boyles Bros. Drilling Company has maintained for fifty years.

The answer to your drilling problem can be found in Diamond Core Drilling under contract. Consult the best in the business. Boyles Bros. engineering know-how will do the job for you.

Full information on request

Boyles Bros. DRILLING COMPANY

1321 SOUTH MAIN STREET • DIAL 6-8555 • SALT LAKE CITY

turning to Climax in 1946 as president.

Dr. Donald H. McLaughlin, president of the Homestake Mining Company, has been nominated for the presidency of the American Institute of Mining Engineers for the 1950 term. Currently he is vice-president of that organization.

Obituaries

George D. Van Dyke, 95, died on April 26 at Milwaukee, Wis. He was an early pioneer in iron mining on the Menominee range of Michigan. He was president of the Menominee Iron Mining Co. and of the Pewabic Mining Co.

John William Johns, 38, former professor of metallurgy at the University of Utah, died May 4 in Niagara Falls, New York, where he had been chief research engineer for the Corborundum Company. Johns headed the department of ore dressing at the university for eight years. Before that he had been employed as mill superintendent at Elkhorn Metals, Inc., Boulder, Colorado, and sales engineer for Denver Equipment Company.

Charles Henry Jacobs, 76, died in Spokane, Washington, May 19. After 17 years of gold mining in the Klondike, Jacobs moved to Newport, Washington, where he continued his mining activities until his death.

William R. Welton, 67, retired mining official, died in Eveleth, Minnesota, May 3. He had been employed at Oliver Iron Mining Company from 1908 through 1946, where he started as track foreman and worked up to superintendent of Oliver's Virginia mines at the time of his retirement.

Dr. Arthur Berkeley Yates, 48, chief geologist for the International Nickel Company, New York, died in Montreal, Quebec, May 10. A graduate of the University of California and Harvard Graduate School, where he was also a research associate for two years, Dr. Yates joined International Nickel in 1931. He was a member of the Canadian Institute of Mining and Metallurgy and the American Institute of Mining and Metallurgical Engineers as well as several other societies. During the past several years he had been stationed in South Africa for the company and had gone to Montreal to receive the Barlow Memorial Medal of the Canadian Institute at its recent annual convention.

A. J. Scheier, 64, died at the Morenci Hospital, Morenci, Arizona, on May 15. He had been in the employ of Phelps Dodge Corporation since 1942, most of the time as assistant shift foreman at the concentrator.

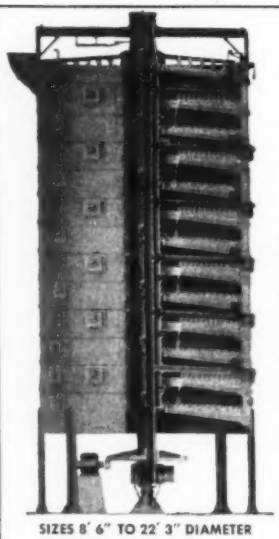
Percy E. Wright, consulting engineer of Hillsboro, New Mexico, and employed at the Empire mine there, died early in May.

A. C. Nebeker, 67, died in Prescott, Arizona, on May 20. He had been regional adviser for the Mining Division of the War Production Board at Phoenix at the time of his death. Subsequent to that, he was superintendent for the Scranton Mining and Smelting Company, general foreman at the Sheldon mines at Walker, Arizona, and directed drilling operations for the New Mexico Potash Company.

Paul A. Gow, who was president of both the Unity Gold Corporation which has properties in Cripple Creek, Colorado, and the North Butte Mining Company, Butte, Montana, died April 27 at Butte.

Ian Gordon, 33, died May 5 in Tombstone, Arizona. He had been associated with his father in the operation of mining properties in the Dragoon Mountains near Tombstone.

William Flori, engineer for the Miami Copper Company, Miami, Arizona, died May 7 at the Papago Park Veterans' Hospital.



SIZES 8' 6" TO 22' 3" DIAMETER
NUMBER OF HEARTHS, 1-16

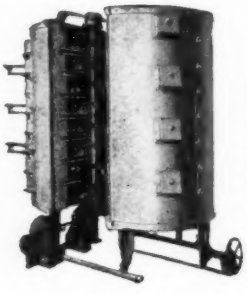
PACIFIC FURNACE

MULTIPLE HEARTH FURNACE

ROASTING • CALCINING
DRYING

ZINC ORES	QUICKSILVER
IRON ORES	MAGNESITE
COPPER ORES	LIMESTONE
TIN ORES	MOLYBDENUM ORES
NICKEL ORES	BONE CHAC
LEAD ORES	DIATOMITE
SODA ASH	LIME SLUDGE
FULLERS EARTH	MAGNESIUM
CARBON	CLAY GRANULES
PYRITE	ANTIMONY

AND FOR NUMEROUS OTHER MATERIALS



Pacific Laboratory Furnace is manufactured in two sizes—36" and 54" inside diameters having 6-8-10 Hearths and include the same features as the commercial size furnace.

PACIFIC FOUNDRY COMPANY LTD.
Engineers and Metallurgists

1400 SO. ALAMEDA ST., LOS ANGELES • 3100 19th ST., SAN FRANCISCO • 551 FIFTH AVE., NEW YORK

Capitol Concentrates

(Continued from Page 9)

● *Policy Answers Question*

The question continually arises as to why the Bureau of Federal Supply, the stockpile purchasing agency which carries out the Munitions Board's policies, does not move into the market and support the falling metal prices. A statement by the Munitions Board, made February 2, 1949, may clear up the mystery. The board announced:

"While national security must be considered paramount, economy is a primary rule in buying. The Munitions Board has followed the policy of never paying more than the market price for materials, and all purchases have been made on that basis."

● *Selective Contracts Not Answer*

The position of the Secretary of the Interior would be a curious one, indeed, were he to secure the individual selective contract legislation for incentive payments which the Interior Department is supposed to be endorsing.

If the secretary bought where he could get the material cheapest (as is the general administration policy and Krug's personal inclination), he would violate the policy Congress wants to establish—of helping the small and marginal miner. If the Secretary gave contracts to high-cost producers, he would be subject to the criticism of wasting the public money and he would be going into the market in competition with the Munitions Board, which board has a public policy of never paying more than the market price for anything.

Such a clash of policies between agencies is inconceivable. The only solution seems to be the Murray-Engle bill system where market prices are not controlled, influenced or affected, and yet the producer makes a living.

● *New Authority May Be Asked*

There are indications that the failure of the ECA program and the Munitions Board's program to bring in substantial quantities of minerals and metals from abroad will induce the government to ask the Congress for new authority in the foreign procurement field.

● *Surface Holders to Be Repaid*

The amendment to the assessment work suspension bill, H. R. 1754, attached at the instance of Senator O'Mahoney of Wyoming, is of interest to all mining people.

On the face of it, the amendment is designed to recompense surface holders for loss of grazing facilities due to destruction of the surface. For certain types of claims on land where the mineral rights were reserved to location, but where the surface was sold for other purposes, the surface holder can claim damages for destruction of improvements such as a corral or corn patch, but not for loss of grass or browse. It would seem equitable, therefore, to include this as undoubtedly the omission in the present law was an oversight. At the same time, this is a permanent change in the mining laws and should not have been hung onto an urgent temporary measure such as H. R. 1754, in committee, without hearings, and passed casually on the Senate calendar without debate.

Repetition of such a procedure may cause miners to wake up some fine morning to find more drastic changes in the law, made without their knowledge.

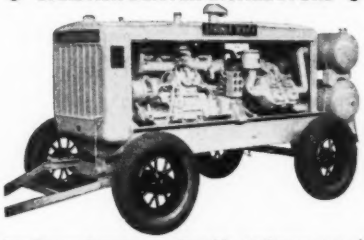
Although the O'Mahoney amendment may be just, it should be judged from a practical viewpoint. One can arrive with some accuracy at the cost of buildings or crops, but an estimation of damage to grazing may be very hard to make. It is easy to see the possibility of a multiplicity of nuisance claims for damages cropping up all over the West, where the surface and mineral rights may not be held by the same parties.

The amendment had already been attached to H. R. 3754, another piece of permanent legislation, but one without the urgency of H. R. 1754. Senator O'Mahoney evidently was taking no chance.

The point is that no change in a permanent statute should be made by the device used in this case and which

HEADQUARTERS FOR MINING AND CONTRACTORS SUPPLIES

● GARDNER-DENVER DISTRIBUTORS ●



Gardner-Denver Compressors—Portable, stationary, gas, electric. Wagon drills, jackhammers, pavement breakers and air hoists.

MARLOW CENTRIFUGAL AND DIAPHRAGM PUMPS

COMPLETE RENTAL SERVICE ON ABOVE

Personalized Field Service by Experienced Mining Men

Timken Bits—Drill Rods *Rochester Wire Rope*
Bethlehem Drill Steel *Ball and Roller Bearings*
Air Hose—Tackle Blocks *V-Belt Drives and Sheaves*

GEORGE M. PHILPOTT CO.

1060 Bryant Street, San Francisco
Phone HEmlock 1-5475

OAKLAND
3257 San Pablo Ave.,
Phone HUmboldt 3-1656

PORTLAND
1635 NW Raleigh St.
Ph. ATwater 9327

"Forced" AMALGAMATION

with the TITAN Rotary Amalgamator

Milling and mining operators get forced amalgamation with a Titan, recovering up to 98% of free gold content! Simple and economical to operate, the Titan Rotary Amalgamator is designed to withstand the most rugged wear—continuous and rotary action of the plates achieves high efficiency . . . no fouling . . . clean-up is simple and fast. Write for full details today.

Manufactured Exclusively by

MILL & MINE SUPPLY, INC.

2700 FOURTH AVE. S. SEATTLE 4, WASH.

may affect a great many people who have been given no chance to be heard, even if the change seems reasonable.

● *Less Politics Would Help*

Although it seems quite certain that the efficiency of multiple Bureau of Mines experimental and research stations, scattered all over the country, is open to question, and it is more than likely that a good deal of duplication of effort results from having so many, bills are continually introduced into Congress to build more of them. When some new station in an area is contemplated by the Bureau and the news leaks out, there is immediately a political dog fight among neighboring states for the location.

Under such conditions, the Bureau can hardly be blamed if some of its operations are too expensive or inefficient. By combining stations, no doubt a great amount of personnel could be saved as well as time and money. There should be some way to take this sort of thing out of politics, but no one has thought of it yet.

● *Zinc Report Creates Alarm*

There seems to be undue alarm over the reported statement of the Munitions Board that it will buy no more zinc for some time. The statement has been construed as preliminary to taking zinc off the strategic list. Informed Washington sources say this is most unlikely and that it does not even mean the minimum requirements of zinc are on hand.

The board has to spread its money over a considerable list of items and tries to keep relatively the same percentage of requirements on hand of each item. Thus, if it had 75 percent of the minimum requirements of one item and around 30 percent of others, it would stop buying that item until the others had approximately caught up. It also must be remembered that the board inherited a good deal of zinc from various sources so that its actual purchases are no measure of the quantity now stockpiled.

● *Stockpile Funds Authorized*

By the time this page is printed the Munitions Board should have its appropriations passed by the Congress and signed by the President. The large amount of money involved, together with the contract authorizations, should enable the Bureau of Federal Supply to begin making substantial purchases.

● *Public Opinion Is Sought*

Copies of a proposed new bill, evidently designed to replace the Spence Stabilization bill, are being circulated widely about the country in order to get the public reaction before it is introduced. One section, labeled, "Procurement Abroad," has in it a number of things to interest the mining industry. The President is given authority to purchase abroad iron ore, manganese, chromite, copper, lead or zinc, and to sell the same on the domestic markets, but not at such prices as "would have the effect of depressing production by competitive domestic producers."

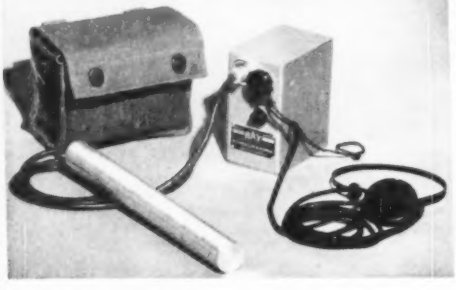
Here is a feature which our jobless miners can appreciate—"in making such purchases or commitments to purchase, consideration shall be given to the effects of such purchases upon the balanced economy of the area from which such materials are procured, including the protection of health, safety, and labor standards in the production for export of the materials procured or to be procured."

● *Monetary Commission Authorized*

A rational move to improve the economic positions of gold and silver is the passage of a bill by the Senate to establish a National Monetary Commission to study domestic monetary and credit policies and international finance. One major recommendation the commission is expected to make, should the bill be passed by the House and signed by the President, is whether or not this country should resume the real gold standard.

GEIGER COUNTER

FOR LOCATING RADIOACTIVE MINERALS



NOW 54.50!

- Lowest Price
- Lightest Weight
- Most Economical to Operate
- Noise-Free, Easily Heard
- Extremely Sensitive
- Flashlight Battery Operated
- Loudest Audible Signal
- Simple, Reliable Circuit

Write for Complete Brochure

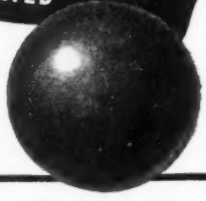
UNIVERSITY APPARATUS CO.

2229 McGEE AVENUE BERKELEY, CALIF.

For the BEST in GRINDING MEDIA come to the

AMERICAN FORGE COMPANY

Forged Steel Balls HEAT TREATED



Alloy Steel Balls Also Furnished

SEND FOR PRICE LIST

AMERICAN FORGE CO.

EXECUTIVE OFFICES

Latham Square Building · Oakland 12, California

PLANTS AT

Berkeley, California and Niles, California

Bear Brand Xanthates

Z-3 POTASSIUM ETHYL

Z-4 SODIUM ETHYL

Z-5 POTASSIUM AMYL

Z-6 POTASSIUM PENTASOL AMYL

Z-8 POTASSIUM SEC. BUTYL

Z-9 POTASSIUM ISOPROPYL

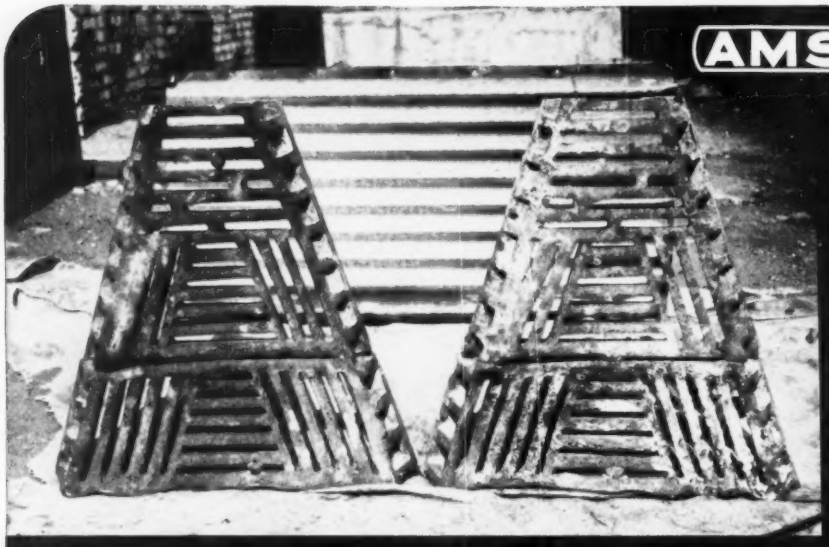
This series of fine collectors is continually being developed and expanded to meet the problems of ore concentration throughout the world. We invite your inquiries concerning flotation concentration.

GREAT WESTERN DIVISION

THE DOW CHEMICAL COMPANY

SAN FRANCISCO 4, CALIFORNIA, U. S. A.

PIONEER PRODUCERS OF XANTHATES FOR METALLURGICAL USE



AMSCO®

Unretouched illustration of Amsco special manganese steel grates . . . after handling 193,797 tons of gold bearing quartz rock in ball mill.

BALL MILL GRATES

after 193,797 tons

Where operations involve impact and abrasion, you will find Brake Shoe facilities a sure source for wearing parts that will stand up longer . . . to give you important reductions in operation cost.

A case in point is the grates used in ball mills. In one application Amsco special manganese steel grates handled a total of 193,797 tons of gold bearing quartz rock . . . without requiring repair of any kind. In addition, slot peening and "blinding" were so little that an acceptable grind was obtained throughout the operating period. In another comparable installation, with Amsco special manganese steel grates, a total of 176,360 tons of quartz rock was handled at a cost of $0.00369 per ton. An important factor was demonstrated here also: while the previous grates gave a 136,923 ton service life, repair was required during this period totalling 29¼ hours; this lost time cost an estimated $200.00 per hour in lost tonnage.

The reason for such outstanding performance with Amsco parts is threefold: (1) Brake Shoe metallurgical research in manganese steel and other alloys makes possible the selection of the best steel or iron to cope with the specific job conditions; (2) Amsco application experience supplementing that of the mill operator often results in design improvements that alone can greatly lengthen operating life; and (3) Amsco foundry practice produces castings with uniform grain structure and dimensional accuracy.

If you think that your mill grates, liners or feeder lips are costing you too much per ton of ore ground, we may be able to help in the solution of your problem. All uses for Amsco alloy steels in metal mines and mills are described in Bulletin 743-M.

AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION
CHICAGO HEIGHTS, ILL.

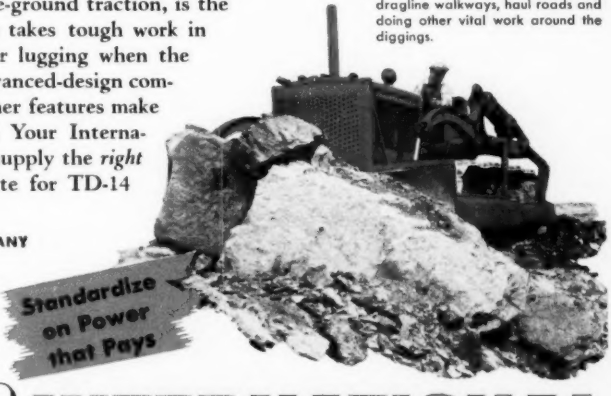
Foundries at Chicago Heights, Ill., New Castle, Del., Denver, Colo., Oakland, Calif., Los Angeles, Calif., St. Louis, Mo.
Offices in principal cities. In Canada: Joliette Steel Limited, Joliette, Que.

A glutton for punishment, powered by a diesel engine with matchless lugging ability and stamina—this is the tractor for you to use on heavy, back-breaking jobs. The International Crawler, with broad-gauge stability, balance and geared-to-the-ground traction, is the worker you need. ● Its powerful engine takes tough work in stride, with increased torque for heavier lugging when the load demands it. All-weather starting, advanced-design combustion, full pressure lubrication and other features make it *your* obvious choice among tractors! Your International Industrial Power Distributor can supply the *right* size with *matched* equipment, now. Write for TD-14 or TD-18 Folders.

INTERNATIONAL HARVESTER COMPANY
Chicago

Hear James Melton and "Harvest of Stars" every Sunday—NBC

An International TD-14 Diesel puts these rocks in their place with its hydraulic blade before building dragline walkways, haul roads and doing other vital work around the diggings.



Standardize on Power that Pays

CRAWLER TRACTORS
WHEEL TRACTORS
DIESEL ENGINES
POWER UNITS

INTERNATIONAL HARVESTER

INTERNATIONAL INDUSTRIAL POWER

COMPLETE MINING–MILLING–CONCENTRATING PLANTS FOR SALE–ALL OR ANY PART

We have a very complete selection of nearly every item needed for mining, milling, construction. Here is a partial list of equipment available.

PIPE AND RAIL

75#, 60#, 52#, 45#, 30# and 20#. Big selection rail.
1", 2", 3", 4", 6", 8" pipe. Large quantities.

STRUCTURAL STEEL

Several complete all steel large buildings, suitable for milling plant. Several hundred tons channels, I beams, columns, angle iron and trusses. Steel ore bins, steel agitator tanks, steel thickener tanks, steel mine lockers.

BALL MILLS

2—#75 Marcys with motors
3—#66 Marcys with motors
1—#76 Marcy with motor
2—5'x8' Denver tube mills
2—5'x13' Denver pebble mills
1—4x4 C.I.W. ball mill
1—4½x3 Ball Foundry ball mill
1—7'x36" Hardinge conical ball mill

PUMPS

1—new 2"x2" Denver type SRL sand pump
1—new 3"x3" Denver type SRL sand pump
2—Wilfley #2 sand pumps
1—Wilfley #3 sand pump
3—Traylor sand pumps. Models 2 and 3R
2—Allis-Chalmers 6 stage centrifugal pumps, 200 gpm, 560' head
1—Allis-Chalmers 4x3 centrifugal pump, 500 gpm, 200' head
2—DeLaval 6 stage centrifugal pumps, 1200 gpm, 1215' head
1—Bingham single stage centrifugal pump, 1000 gpm, 450' head
1—Allis-Chalmers 8x6 centrifugal pump, 1400 gpm, 290' head
1—Kimball Krough 3"x10" single stage centrifugal pump
1—Byron Jackson 13 stage deep well pump, 250 gpm, 238' head
1—Byron Jackson 8 stage submersible pump, 300' head, 500 gpm
1—Byron Jackson submersible pump, 6-7 stage, 1000 gal, 300' head
5—type VRS Bingham pumps
5—3" Kimball Krough solid lined tailings pumps
1—Deming Triplex 4"x6" pump, 59 gpm
1—2½"x2" Deming Triplex pump, 8.89 gpm
1—4½"x6" Deming Triplex pump, 74 gpm
2—Ingersoll-Rand 2RV7½ motorpumps, 125 gpm, 175' head
1—Ingersoll-Rand 2RVH20 pump, 300 gpm
1—Ingersoll-Rand IRV 1½ motorpump
2—6"x8" Bingham type HSL pumps, 900 gpm, 90' head
1—Ingersoll-Rand 2MRV50 pump, 300 gpm, 400' head

MINE HOISTS

1—Hendrie Bolthoff double drum hoist, 60 HP
1—Washington Iron Works single drum hoist, 175 HP
1—Hendrie Bolthoff single drum hoist, 15 HP
1—Sullivan single drum hoist, 7½ HP
1—Allis-Chalmers double drum hoist, 800 HP
1—Hendrie Bolthoff single drum hoist, 100 HP
1—Ottumwa single drum mine hoist, 250 HP
1—F.M. Davis Iron Works double drum shaft hoist, 80 HP
4—Sullivan double drum tugger hoists, 10 HP
2—Sullivan double drum tugger hoists, 7½ HP
2—Sullivan A211 tuggers, 15 HP
1—HNN-1J Ingersoll-Rand slusher air hoist
1—EUA Ingersoll-Rand single drum air hoist

MOTORS

Approximately 500 motors, from ¼ HP to 300 HP available, nearly all sizes and descriptions.

AERIAL TRAMWAYS

Leschen & Sons 43091 lineal feet wire rope tramway
American Steel & Wire, 16,474' aerial tramway
5.7 mile tramway, steel towers, complete installation

LOCOMOTIVES

2—Baldwin Westinghouse mine locomotives, 24" gauge, 5 ton
4—G.E. mine electric trolley type locomotives, 18" gauge
1—Steam locomotive, standard gauge, weighs 55,000 lbs.
2—4 ton Goodman trolley mine motors, 36" gauge or 24" gauge
6—Baldwin Westinghouse locomotives, 4 ton, 24" gauge

MINE CARS

10—Granby mine cars, 4 ton, 80 cu. ft., side dump, 24" gauge
50—Sanford Day bottom dump mine cars, 89 cu. ft., 36" gauge
38—Truax 1¼ ton mine cars, 18" gauge
22—15 cu. ft. 18" gauge
30—8 ton, 24" gauge, 157 cu. ft.
16—3 ton, 24" gauge, 47 cu. ft.
Man cars, powder cars

CRUSHERS

2—8"x20" Blake jaw crushers
1—Allis-Chalmers 55x24 crushing rolls
1—new 22" Symons intermediate cone crusher
1—assay lab jaw crusher, Krom 5"x12"
2—Gyratory type Allis-Chalmers #5 style K crushers
1—Farrel jaw crusher 13"x30"
1—Denver 8"x10" crusher

ELEVATORS

1—belt-bucket elevator, 48' centers
2—belt-bucket elevator, 40' centers
1—Freight elevator, 5000 lb. capacity, electric driven
1—belt-bucket elevator, 42' high, 25 HP
2—vertical belt-bucket elevator, 166.8 ft., 50 HP
1—Jeffrey bucket elevator, 20' centers, 7" belt
1—70' center bucket elevator, 18" belt, 20 HP

COMPRESSORS

1—Ingersoll-Rand 650 cu. ft., 100 HP air compressor
1—Ingersoll-Rand 1000 cu. ft., 150 HP air compressor
1—Imperial type 10 I.R. compressor, 75 HP
1—single cylinder compressor 9"x12", 40 HP
1—Chicago Pneumatic 20" & 12"x16", 2300 cu. ft. compressor
1—Ingersoll-Rand 676 cu. ft., 2 stage air compressor
1—Ingersoll-Rand 488 cu. ft., 2 stage air compressor
1—Gardner-Denver 100 cu. ft. gas driven, on skids

SKIPS

3—mine skips, top 54"x42", bottom 39"x30"
1—bottom dump type skip, with man deck
1—man skip or car for inclined shaft
3—skips for inclined shaft, 30" wide, 43", 40", 46" high

CAGES

1—complete man cage, hurricane deck
3—double deck cages
1—single deck mine cage for vertical shaft
Write for drawings.

MOTOR GENERATOR SETS

2—50 KW generators, G.E. with 75 HP motors and switchboard panels
1—35 KW generator, G.E. with 50 HP motor and switchboard
2—2 KW G.E. generator sets, used for charging lamps
1—Westinghouse AC generator, 62 KVA with International gas engine
1—Climax gas motor with G.E. 60 HP motor and switchboard panel
3—AC generators, 50 KW, 100 KW, 150 KW
1—Westinghouse motor generator set, 12½ KW, 20 HP
1—100 KW motor generator set, 150 HP motor
1—45 KW Westinghouse generator, 50 HP motor and control panel

SWITCHBOARD PANELS

1—switchboard panel, 3 phase, 60 cycle, 6900 volt
2—G.E. 2000 KVA switchboard panel type ATF
2—G.E. 2200 volt switchboard panel
1—G.E. switchboard panel with oil circuit breaker operating lever
1—G.E. panel switchboard, 25 KVA capacity

THICKENERS

2—Dorr thickeners, redwood tanks 10'x40', 10 HP
1—Dorr thickener, redwood tank, 14'x8'
2—Dorr thickeners, redwood tanks 24'x8'
5—Dorr type A thickener mechanisms complete for 45' tanks

TRANSFORMERS

3 KVA to 833 KVA transformers, large range sizes and voltages. Also metering and instrument transformers

MUCKING MACHINES

4—Eimco No. 12, 18" gauge, one 24", reconditioned
2—Eimco No. 21, 24" or 36" gauge, reconditioned

RECEIVERS

1—54"x14' air receiver, 105 lb. pressure
1—36"x10' air receiver, riveted
1—36"x6' air receiver, riveted
1—36"x10' air receiver
2—5'x12' horizontal air receivers, riveted
1—4'x20' horizontal air receiver, riveted
1—30"x6' air receiver, vertical
1—40"x9' air receiver, ⅜" plate steel

ROCK DRILLS

6—Chicago Pneumatic drills, CP6 drifters
2—FM2 wagon drills
Many 35 to 55 lb. jackhammers, JA50 and S-49 I.R. jackhammers
4—Worthington drifters, Model H80A
DA-30, DA35 drifters, Ingersoll-Rand

DIESEL

1—70 KVA diesel generator set, Caterpillar D13000 engine

MISCELLANEOUS

Steel mine lockers
Steam heating plant
Dump trucks
Mancha trammers
IR50 sharpener
Slusher buckets, several used and new, all sizes
New I.R. 45 shank and bit punches. Modernize your sharpener at ⅓ factory cost.

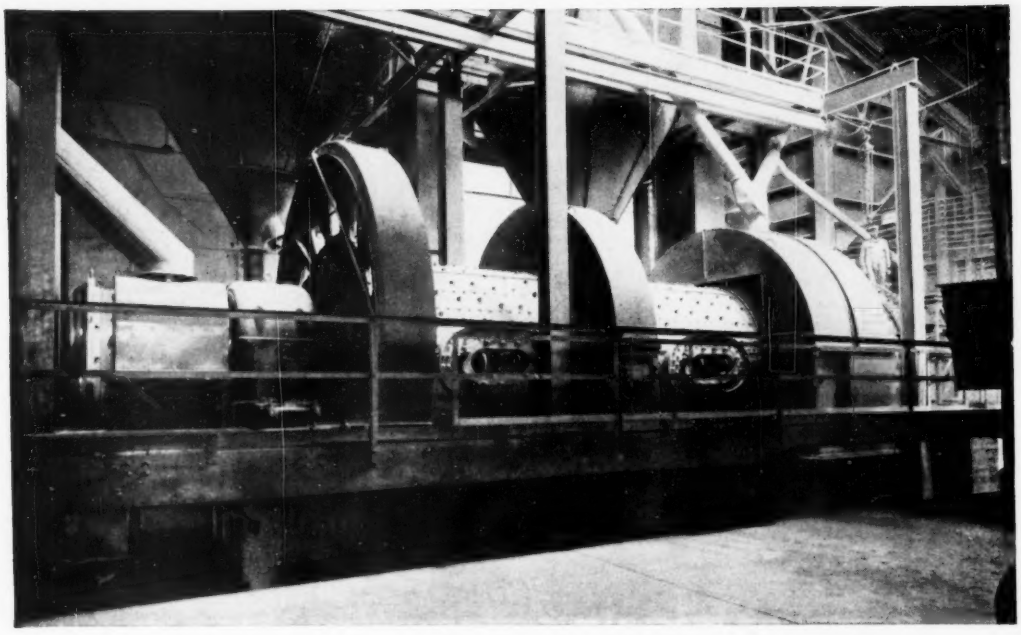
COMPLETE 50 TON CYANIDE MILL PRICED RIGHT. BLOWERS — BELT TRIPPERS — CLASSIFIERS — ELECTRIC CABLE — FEEDERS — FILTERS— MAGNETS — SAMPLERS — SCRAPERS — SCREENS — MINE RESCUE EQUIPMENT — BLACKSMITH MACHINERY — TIMBER FRAMERS — ORE BINS — LARGE MOTOR DRYING OVEN — MACHINE SHOP EQUIPMENT — OFFICE SUPPLIES.

WE ARE LIQUIDATING NOW FIVE LARGE PLANTS • WRITE OR WIRE FOR OUR PLANT INVENTORIES

PHONE 92021

CATE EQUIPMENT COMPANY

49 EAST NINTH SOUTH
SALT LAKE CITY, UTAH



Grinds 6,000,000 Tons in 19 Years: 16-20 Hours a Day

TAKES REAL TOUGHNESS to stand a long grind like this. Yet, after 19 years, this 9½ ft diameter, 3-compartment dry grinding *Compeb* mill is still going strong for a large cement company.

On the job 16 to 20 hours a day, this Allis-Chalmers mill reduces limestone and shale to a specification raw mix for a rotary cement kiln. Aside from routine liner and grinding media replacement, the mill has required only *one major repair,* a pinion and pinion shaft.

CHECK THESE STRENGTH FEATURES

Strength and stamina are built into every part of Allis-Chalmers *Compeb* mills.

- Bearings, for example, are extra large and equipped with flood lubrication . . . your assurance of low bearing pressure, long life.
- Mill shells are of all-welded construction, "stress-relieved" after welding to minimize strains.
- Mill heads are designed for maximum strength per pound of metal used.

CHOOSE FROM 5 MILL TYPES

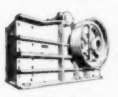
When you specify Allis-Chalmers for grinding mills you'll get a mill that's *well-suited to your specific grinding job.* A-C builds five separate types of grinding mills in a maximum range of sizes . . . with overflow, diaphragm grate or special discharge modifications . . . with feeder and drive to suit your mill size and application.

For sound advice on your grinding problems — based on A-C's experience in building *over 4,000* mills—call your nearby A-C representative. Offices or distributors in principal cities in the U.S. and throughout the world.

Compeb is an Allis-Chalmers trademark.

A2672

Kilns, Coolers, Dryers



Jaw Crushers

Hoists

Mills

Gyratory Crushers

Vibrating Screens

AND OTHER EQUIPMENT FOR THE CRUSHING, CEMENT AND MINING INDUSTRIES

ALLIS-CHALMERS, 985A SO. 70 ST.
MILWAUKEE, WIS.

A-C ALLIS-CHALMERS

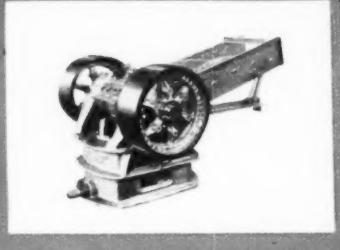
ALLIS-CHALMERS

Pacific jaw crushers

PREFERRED BY MINERS THROUGHOUT THE WORLD

STRONG, rugged construction—built to last on the severest crushing jobs. Manganese steel jaws for longer life in the most abrasive rock. A size for every crushing requirement—there are six sizes to choose from—all available for immediate delivery. For unsurpassed dependable performance and economical operation specify **PACIFIC JAW CRUSHERS.**

For increased production and longer crusher life equip your **PACIFIC JAW CRUSHER** with a **PACIFIC FEEDER SCREEN** or **SHAKING GRIZZLY**—they selectively screen out the rock already to size before the crushing operation.



ALLOY STEEL & METALS CO.

1862 EAST 55TH. STREET • LOS ANGELES 11, CALIFORNIA

WORLD MINING

The International Department of MINING WORLD

SAN FRANCISCO, CALIFORNIA JULY, 1949

INTERNATIONAL PANORAMA

INDIA—Recent discovery of uranium bearing ore has been made by A. M. Chatterjee, geologist, Northern India Mining Syndicate, in two more locations in the Bihar mica belt lying in the districts of Hazaribagh, Gaya and Monghyr.

JOHANNESBURG—A gold strike described as the richest and most sensational in the history of South Africa was announced by the Free State Gold Areas, Inc., in early June. Reports indicated assays exceeding 400 oz. of gold per ton.

BUTTE—As a consequence of the decline in copper prices, Anaconda Copper Mining Company announced in the first week of June that it will defer work on its huge Montana development, the Greater Butte project. This is a long-term undertaking, thoroughly described in the September, 1948, issue of MINING WORLD.

CHILE—The gold situation, as this issue goes to press, is remarkable in the Republic as the gram of gold is worth 142 Chilean pesos or 4,371 pesos an ounce. The free market price for U. S. dollars is about 62 pesos per dollar, thus permitting the return of U.S. $70 per ounce.

LA PAZ—Tin mining in Bolivia—production nearly 37,000 tons in 1948—was, for all practical purposes, paralyzed as the result of a strike of miners in late May. Patino, Aramayo and Hochschilds interests were affected.

WASHINGTON, D. C.—A concerted move to restore the import duty on foreign copper has followed the slump in American copper production.

CANADA—As of this date, the Canadian government has made no provision to expedite the program for expansion of the steel industry. This, coupled with the general easing of world supply, leads observers to believe that the program has been shelved.

SCOTLAND—Development plans announced as requiring the investment of £4,000,000 and needing two years to complete are soon to be under way at the River Clyde Iron Works. The steel plant at Clydebridge will have two additional tilting furnaces of 300 tons daily capacity and additional steel capacity of 175,000 tons will be provided.

SIDNEY—The decision of the State to subsidize selected mines in the Bendigo area and the announcement that the Commonwealth intends to assist marginal mines in Western Australia indicates the possible revival of the gold mining industry for Australia.

WASHINGTON, D. C.—Fertilizer sales in the U. S. topped 1,206,000 tons during April according to figures released by the National Fertilizer Association. This compares with 1,085,000 in 1948. So far the cumulative sales for the period January-April have totaled 5,885,836 tons against 5,094,715 a year ago.

SOUTH AFRICA—Compromise has been reached between the Union of South Africa and the International Monetary Fund relative to the Union's plan to sell semi-fabricated gold at more than $35 an ounce. Provision is made for the Union government to dispose of gold if safeguards are provided to prevent the gold from becoming circulating medium.

ALASKA—Preparations are under way to start development of the Cape Mountain tin deposit, 105 miles north of Nome on the Seward Peninsula, the western-most tip of North America. The property was diamond drilled by the U. S. Bureau of Mines last year.

CALIFORNIA—The Thomson Divide Mining Company of Redding is reported to be planning installation of a bucket-line dredge in the Minersville area on the Trinity River near Weaverville. It is understood that the dredge will be equipped with buckets of 13 cu. ft. capacity, capable of digging 100'.

BURMA—Shares of the Burma Corporation have taken a drop due to the fact that the property has been placed on a maintenance basis. Terrorist activities have made transportation impossible, thereby necessitating a postponement of rehabilitation plans.

CEYLON—With a capitalization of £1,800,000, the Bogala Graphite Corporation has been organized with intentions of expanding graphite production and setting up secondary industries. Cooperating in the new venture are the proprietors of the Bogala mines and the Pilot Industrial Trust, Ltd., of London.

MONTANA—The U. S. Bureau of Mines representatives will visit the Phillipsburg district to re-examine the area as a potential source of manganese for a government stockpiling program, according to an announcement by Dr. James E. Boyd, Bureau director.

BRITISH COLUMBIA—Glenville H. Collins, president of North American Goldfields, Ltd., announced recently that his company has interested the Yuba Construction Company of San Francisco in testing the North American placer leases at French Flats on the Quesnel River. If test results are satisfactory, Yuba may install a 10,000 cu. yd. dredge.

Yukon Placer Takes Over New Operation

It was recently announced that the Yukon Placer Mining Company would begin a new operation in the 60-Mile area by Charles F. Herbert.

The 60-Mile operation, on Big Gold Creek, formerly was developed by the Yukon Exploration, Ltd., and will be a dredging proposition. A great deal of preliminary work will have to be done this year and it is not likely that the dredge will be operated, according to Herbert, who will be in charge of the new development. An undetermined number of men will be employed in the camp.

Other operations of the same company that will be in production this year are at Jack Wade, Fourth of July Creek, Canyon Creek and Walkers Fork, each one of these to be in charge of one of the partners, who are Glen Franklin, Leonard Stampe, Harold Schmidt and Earl Ellington.

Hematite Tailings Floated In Swedish Plant

The problem of recovering specular hematite from mill tailings by a flotation process at the Royal Institute of Technology, Stockholm, has been solved, after some years of research, by Professor Gustav Bring, former professor of mining and ore dressing at the institute.

The principal difficulty in conducting the experiments was to find a means of depressing the admixed gangue, a readily floatable apatite, to permit the recovery of an iron concentrate low in phosphorus and suitable for the manufacture of charcoal iron.

In 1947 a full sized plant was planned at the Balsjo mill, Norberg mines, for the recovery of the finely divided hematite, washed over into the tailings from the shaking tables. Because of delay in delivery of machinery the flotation plant started operations in the fall of 1948 and since that time it has been in regular operation.

The grain size of the tailings is below 0.6 mm (28 mesh) and that of the associated hematite is below 100 mesh. Capacity at present is five metric tons hourly. Specifications for the concentrate are set for at least 60 percent iron and not more than 0.010 percent phosphorus. Results

WORLD MINING

Issued as an International Department of MINING WORLD

by American Trade Journals, 121 Second St., San Francisco, California.

A Miller Freeman Publication

President . . . MILLER FREEMAN
Publisher . . . W. B. FREEMAN
General Manager . M. F. HOLSINGER
Editor . . . JOHN B. DORSH, E. M.
Production Manager . E. B. HERINGTON
Eastern Manager . . K. WEGKAMP

Regular correspondents in the following cities and mining centers:

Santiago, Antwerp, Stockholm, Cyprus, Tientsin, San Jose (Costa Rica), Baguio (Philippines), London, Tokyo, Frankfurt, Medellin (Colombia), Strangways (Victoria, Australia), Vancouver, Paris, Bangkok, Mexico City, Helsinki, Tananarive (Madagascar), Redruth (Cornwall), Oslo, Benares (India), Dersley (Transvaal, South Africa), Budapest, Singapore, Buenos Aires, Lisbon, Madrid, Ankara, Lima, Rome, Sao Paulo.

WORLD MINING is published the 26th of each month as a regular department of MINING WORLD and is also circulated as a separate section on a carefully controlled free basis to a selected list of management and supervisory personnel associated with active mining enterprises throughout the world.

thus far obtained show that these stipulations are met easily.

The reagents used are sodium silicate, fluosilic acid, tall oil, pine oil, and diluted sulphuric acid. Total reagent cost amounts to about $0.30 per metric ton of feed.

Rand Underground Working Conditions Improving

The striking improvement in underground working conditions on the Witwatersrand, South Africa, over the past 10 years is noted in the recently released figures quoted to the governmental commission inquiring into the wages and working conditions of the daily-paid gold mining employees.

In 1931, 6,857 routine samples taken by members of the Government Mining Engineers' staff gave an average dust count of 233 particles per c.c. of air. In 1948, using a new technique which gives better results than the former method, 34,010 samples averaged only 134 particles per c.c.

Although mines in certain areas of the Rand are now considerably deeper, and worked out areas more more extensive than 10 years ago, humidity conditions have actually improved, as shown by the following comparative figures: Wet Kata readings at a depth to 4,000' showed humidity improved from 11.7 in 1938 to 12.6 in 1948; at a depth of 6,000'-7,000', the 1938 figure was 7.2 as compared with 9.0 in 1948; at 8,000'-9,000', a 7.2 figure in 1938 was considerably improved to 10.6 in 1948.

These improvements have been brought about by employing greater air volumes, sealing off old workings and improving coursing and splitting of air.

India Reports Discovery Of Uranium Bearing Ore

Recent discovery of uranium bearing ore has been made by A. N. Chatterjee, geologist, Northern India Mining Syndicate, in two more locations in the Bihar mica belt in the districts of Hazaribagh, Gaya and Monghyr. The mineralization occurs in nodules embedded as a constituent of gneissic rocks. Small in size, the largest are about one inch in diameter and weigh in the neighborhood of four pounds. Stripping of the surface is going on at present and the uranium bearing formation is being laid bare.

Apparently the uraninite occurs as a primary constituent of the gneiss. Cavities formed by decomposition or solution of the feldspar were filled by concretionary forms that occur as nodules.

An estimate of the production of the area cannot be made at this time.

Recovery of Gallium From Bauxite Now Possible

A process for recovery of gallium from bauxite, which should make possible a variety of industrial applications, has been developed by the Aluminum Company of America.

Anaconda Copper Company produced several thousand grams of gallium in 1943 to 1945, but only Eagle-Picher Mining Company produced in 1946, according to a Bureau of Mines survey.

Gallium is liquid at 86 degrees Fahrenheit, but has a high boiling point which makes it useful in certain military devices.

Worst Underground Fire In Rand's History Curbed

An underground fire, said to be the worst in the Rand's history, was finally brought under control May 21 after raging for more than two weeks in the Chris section of the Robinson Deep property.

Discovered at midnight, May 3, on a 58-level drive 6,630' down, the blaze resisted initial attempts to extinguish it by crews employing sand tailings from a surface dump. With all underground personnel safely removed, a second unsuccessful attempt was made to bring the fire under control by sealing off the affected area.

At this stage, the fire spread from the 58 up to the 50 level, and 100 Proto-equipped teams of six men each, taken from 24 of the Rand's mines, were engaged in the battle. The third and successful plan forced the fire to the 48 level by control of the drafts, where it burned itself out against a dike that interrupted the series of stopes stretching from level to level and up which the fire had traveled. So far, the cause of the fire and the damage sustained have not been made public.

Norwegian Mine Officials Get ECA Technical Aid

Arrival in the United States of two officials of the Sydvaranger A/S Iron Mines in northern Norway was signal for a new project, designed to assist Norway in the rehabilitation of mines destroyed by the Germans during the war, to get under way.

The Norwegian technicians, Arne Stavang and Arne Hofseth, will spend six months in the United States studying mining methods and equipment which might be adapted for use in mine operations in Norway. They are particularly interested in modern methods of open pit mining, equipment used for milling and transporting ore, and American methods of pelletizing iron ore. They are also scheduled to visit the Minnesota Mesabi Iron Range and copper mines in Arizona and New Mexico.

The Bureau of Mines, Department of the Interior, is cooperating with ECA's Technical Assistance Division in arranging the studies.

Canadian Company in Search of New Sites

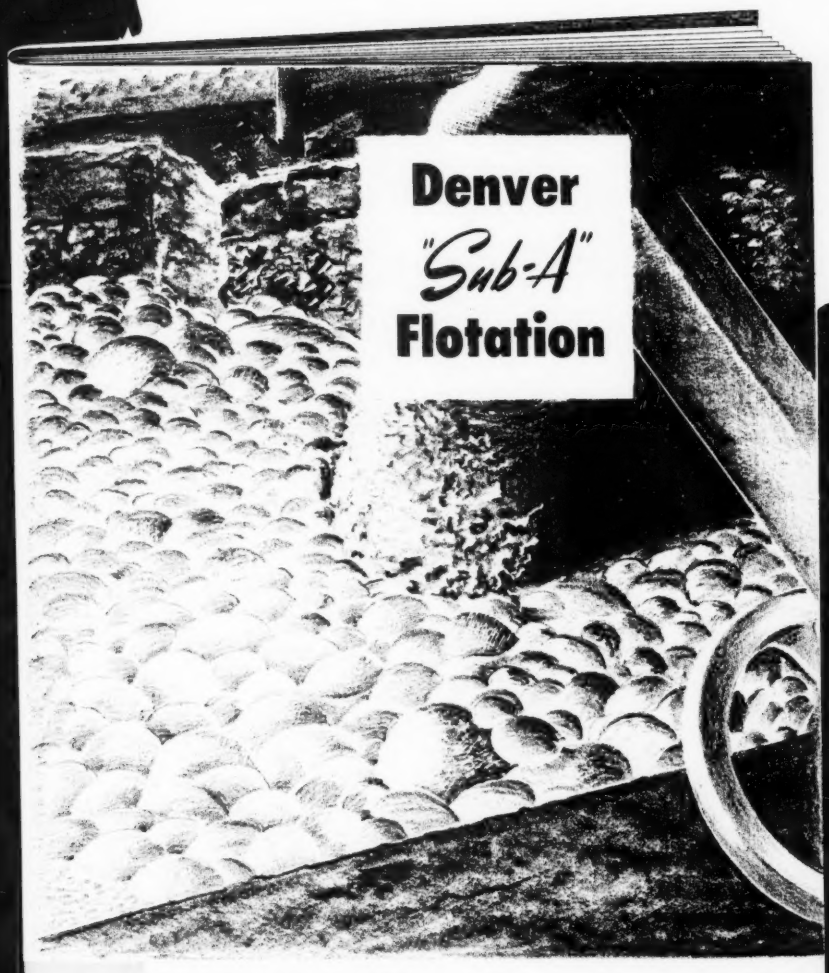
The management of Aluminum, Ltd., Montreal, Canada, confident in its belief that there is substantial long-term growth ahead for the industry, is investigating many areas of the world to find potential sites well suited to new primary production.

The aluminum production facilities of Germany and Japan have been utilized only to a small extent since the war, but there are indications that their operations will probably be increased in the coming years. Due in part to power shortage, smelting facilities in some Canadian reduction plants have not been operating at full capacity.

Shipments in 1948, by the company's subsidiaries, totaling 382,000 metric tons, were 40 percent higher than in 1947, N. V. Davis, president of Aluminum, Ltd., said.

NEW!

Manual on Flotation



- ★ *Discovery*
- ★ *Theory*
- ★ *Application*
- ★ *New Developments*
- ★ *Flexibility*
- ★ *Results*

There are definite reasons why more ore is processed by Flotation than by any other method of mineral recovery. This manual, "Denver 'Sub-A' Flotation," should be a part of every Engineering Notebook.

DENVER EQUIPMENT COMPANY 24 HOUR SERVICE

FLOTATION ENGINEERS

BULLETIN NO. F10 • B29

IF YOU DO NOT ALREADY HAVE YOUR COPY, WRITE TODAY...
Sent, as a service, without cost or obligation.

Denver Equipment Company
1404 17th Street, Denver, Colorado
...please send copy of "Denver 'Sub-A' Flotation" to:

Name_____
Title_____
Company_____
Address_____

EIMCO *RockerShovels* - 5 point superiority

★ Dependability
★ Power
★ Speed
★ Safety
★ Economy

These are minimum requirements of a loading machine. All 5 are built into Eimco RockerShovels.

Your mine or contract job requires all five of the points listed above. You cannot sacrifice any of these features.

Each point is important, yet each one without all the others may be a costly omission.

Speed and power team up to clean out the face—they're time saving. Safety, protection for the operator — that's labor saving. Economy and Dependability team up to provide long life, better loading and cheaper maintenance—these may well be job saving.

These are the essentials, but RockerShovels do not stop there. They're easier on the man because they're easier to operate and they're watched at no expense to you by the Eimco service engineer who will call at your property if you wish.

Thousands of RockerShovels are moving dirt, rock and ore by the hundreds of thousands of tons every day. The users know why they have chosen Eimco RockerShovels — it is because in RockerShovels they have found the combination of all five points.

Write for information on Eimco RockerShovels.

for superior performance use EIMCO *RockerShovels*

EIMCO

THE EIMCO CORPORATION
The World's Largest Manufacturers of Underground Rock Loading Machines
EXECUTIVE OFFICES AND FACTORIES — SALT LAKE CITY 8, UTAH, U. S. A.
BRANCHES: NEW YORK, CHICAGO, BIRMINGHAM, EL PASO, SACRAMENTO, MANILA
AFFILIATED COMPANIES: SOCIETE EIMCO, PARIS, FRANCE
EIMCO (GREAT BRITAIN) LTD., LEEDS 12, ENGLAND
AGENTS IN ALL PRINCIPAL CITIES THROUGHOUT THE WORLD

A10J

GRAB SAMPLES—From the Mail

Rectification

Dear Sir:

In the April, 1949, issue of MINING WORLD the following paragraph appeared:

"CYPRUS—The fire which broke out in the Mavrovouni copper mine has now spread to the underground galleries, which have had to be sealed off to prevent further spreading. As a result, some 800 miners have been dismissed, or about half of the underground complement. The company also owns the Skouriotissa mine, which has been closed down for some time, due, originally, to a fire there.

The facts are as follows: The fire in the Mavrovouni mine broke out on February 1; was brought under control on February 4; and the employees of the mine were returned to their jobs after a temporary lay-off of 5½ days. There were no discharges as a result of the fire, and production during the month of February was reduced as a result of the fire by only 25%. The normal rate of production was reached within two or three days after the fire was brought under control.

The Skouriotissa mine has been closed down since the latter part of 1939 when World War II started. It was closed down because of the war and not as the result of a fire.

Henry T. Mudd,
General Manager
Cyprus Mines Corporation

MINING WORLD is glad to publish the facts about the Mavrovouni mine fire.—Ed.

Transferred from Java

Dear Sir:

Today I received your very interesting monthly which was sent to my former address at Batavia, Java. Because I appreciate WORLD MINING I should like to receive it more regularly at my new address:

Ir. H. Th. Bakker
Lijsterbeslaan 39
Hilversum, Holland

Revelation for Advertisers

Dear Sir:

With great pleasure we thank you for the copy of WORLD MINING of March and all the members of our Syndicate studied the articles with care and interest. We congratulate the American experts and engineers for so many new inventions and advances in machinery design which forward the mining industry, thereby contributing directly to the wealth of MINING WORLD.

We shall remain indebted to you if you continue sending us all issues of this magazine in the future.

Though the publication contains a limited number of pages, it is very impressive. The articles on prospecting for uranium gave impetus to our geologists to make careful observations for occurrences of the radioactive minerals in mica pegmatites and in galena and copper deposits. Good results are hoped for soon.

A. N. Chatterjee, Geologist
Northern India Mining Syndicate
3/6 Old Court House Corner
Calcutta, India

Used for Research

Dear Sir:

It was most considerate of you to send a complimentary copy of the April number of WORLD MINING to the Institute. It was full of valuable articles of use to the library of the Institute. The copy will be stocked permanently in the library and used for research work and as a reference.

Again, I wish to express my genuine appreciation of your support.

Kenji Ono, Director
Research Institute of Mineral Dressing and Metallurgy
Tohoku University
Nagamachi, Sendai, Japan

Mechanization in Japan

Dear Sir:

I received your February issue and was interested in the article, "Bunkerhill's Mechanization," by R. S. Hooper. Mechanization being one of the most important problems for our mining circle, the article contains many suggestions useful to us. I would like to ask your permission to translate and publish that article in our bulletin.

Kannosuke Hayami,
Managing Director
Japan Mining Industry Assn.
Tokyo, Japan

Norwegian Students' Request

Dear Sir:

We have had the opportunity of reviewing a couple of issues of your very interesting magazine, WORLD MINING, and we have learned that you distribute free subscriptions to management and supervisory personnel. Therefore, we request that you favor us with two subscriptions although we are neither managers nor supervisors yet.

The magazine will be added to the Club's own library and circulated among the members.

For the Mining and Metallurgy Students Club of the Institute of Technology of Norway,

O. Johansen
Trondheim, Norway

Geographical Nomenclature

Dear Sir:

I write to invite your attention to the information published in WORLD MINING, issue of September, 1948, page 52, column three, under the caption of "India."

There is no place called "Malnwali" in India. It should be "Mianwali." The celestite deposit referred to has been discovered at this place. It lies in the newly created dominion of Pakistan after partition of India in August, 1947. India and Pakistan are not one country, hence please publish always the news regarding Pakistan under a separate head.

Would you please send me regularly WORLD MINING at the address lived below.

S. Tayyab Ali, Geologist
Geological Survey of Pakistan
Gymkhana Road
Quetta, Pakistan

MARK C. MALAMPHY & CO., LTD.
Consulting Geologists and Geophysicists. P.O. Box 209, Mufulira, Northern Rhodesia. Experienced field crews available for examinations and surveys anywhere in Africa.

FOR SALE

Six cu. ft.

"YUBA"

gold placer bucket line pontoon dredge, capable of digging 35 ft. below pond water level.

Dredge is equipped with:

3—Step down transformers from outside power source, 60 cycle, 3 phase, 440 volt power required.

8—Two cell Pan American placer type jigs. Size of each cell 42 in. x 42 in. Complete with accessories.

1—Scavenger jig.

2—Rear steel spuds, 50 ft. long.
110 ft. stacker
Heating boiler and insulated house.

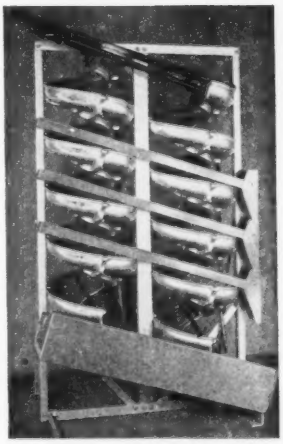
The dredge is in first class operating condition, in the pond near Helena, Montana, where work was completed, and may be inspected.

Will sell complete unit f.o.b. railroad cars, Clancy, Montana.

Additional information will be furnished upon request.

WINSTON BROS. COMPANY
1470 Northwestern Bank Building
Minneapolis 2, Minnesota

HUMPHREYS SPIRAL CONCENTRATOR



LOW COST OF INSTALLATION
NO MOVING PARTS
LOW OPERATING COST

Engineering Division
The Humphreys Investment Co.
909 First National Bank Building
DENVER 2, COLORADO

Drilling is done with these crawler-mounted jumbos. The base is powered by a Sullivan air motor and the boom is motivated by a small Sullivan air tugger hoist. It mounts two Ingersoll-Rand 505 automatic feed drifters with 1¼" steel and detachable bits. Bill Hill and Orville Hunt are putting in an 11' slab round.

KENOYER MINE MECHANIZATION

This Tri-State operation by innovation of mechanical equipment throughout has reduced operating costs and increased output remarkably

A showplace of modern metal mine mechanization is the Kenoyer mine of the Eagle Picher Mining & Smelting Company at Cardin, Oklahoma. By starting from scratch and completely equipping the mine with new, diesel powered machinery, the company has gone all-out to make this property a model of high-speed, low-cost efficient mining as determined by many years of research and pioneering in new methods applicable to conditions of the Tri-State mining district. The operation is a tribute to mechanical ingenuity and a joy to the efficiency minded engineer or the cost conscious manager as well as nearly perfect conditions for the miner who works there.

Insofar as possible automatic equipment has replaced hand labor. Diesel trucks are loaded by diesel powered shovels and airpowered, crawler-mounted jumbos are used in drilling. Even air requirements are met by compressor units mounted on pneumatic-tired trailers that can be towed from place to place.

The Kenoyer mine is a 200-acre lease acquired by Eagle Picher from the American Zinc, Lead and Smelting Company, that purchased it just after the war from Evans Wallower, and conducted limited operations until fire destroyed the mill last August.

The new owners removed all equipment from the underground workings including mine cars, locomotives and track. A steel hoppered derrick was moved to the 200', so-called Millshaft, now No. 1, and a new wooden derrick was built at the No. 2 shaft. Haulage drifts were widened and roads to the principal producing areas were dozed out and graveled. Thirty days after the new machinery was installed, production was at 13,000 tons per month. It was later increased to 22,000 tons when the second shaft got into full operation.

Each phase of the operation is predicated upon handling maximum amounts of material in a minimum of time. Drilling and blasting practice is about normal for the district, but not so for the drill mounting. The jumbos in use are strictly an Eagle Picher development. Built in the company's own shops, they consist of a crawler base powered by a 9-hp. Sullivan air motor and a boom for carrying the drills, similar to that on a small shovel or crane which is raised and lowered by a 3-hp. Sullivan, single-drum air powered slusher hoist. Each jumbo mounts two Ingersoll-Rand 505 automatic feed drifters with 1¼" steel and detachable bits. These are regular star bits manufactured by Ingersoll-Rand, Timken and others. The new throw-away type bits and those with carbide inserts have not been able to match the costs obtained with regular detachable steel bits in the hard, abrasive Tri-State ground.

The principal advantage of using this type jumbo is, of course, its mobility. It can be moved to the working place and be in operation in a small fraction of the time required to make a column and cross arm set up. In addition, it gives considerably more flexibility in the large orebodies with high backs that are common to the area.

Use of Tractor Mounted Shovels

A major time and cost saving is effected in the loading operation. Slushing or mucking into small cans has been replaced by loading directly into dump trucks with a 1-yd. tractor mounted shovel. Standard Tracto Shovels, manufactured by the Tractomotive Corporation, Deerfield, Illinois, mounted on Allis-Chalmers HD-5 crawler tractors have been slightly modified on the operation to perform the work. The tractor is a diesel unit powered by a 42-hp., two-cycle General Motors engine. The modifications on the hydraulically operated loading shovel consist of a minor amount of "beefing up" of certain structural members to withstand the strain imposed by heavy underground mining. It was necessary also to replace the tractor spring with a rigid beam.

Eagle Picher operates ten of these units, five of them in the Kenoyer. Each unit will handle an average of about 220 tons per 7½-hour shift, and the record output for a single machine to date is 323 tons in one shift. This represents a substantial increase in capacity and about 30 percent saving in cost over the slusher system formerly employed. Much of the saving stems from the reduction in set up time, elimination of wire rope wear which cost nearly 4c per ton, mobility in small areas and the use of larger hauling units. Capital investment for the two methods is about the same.

Extremely abrasive ground has caused excessive wear on stock tractor treads and a set lasts only five to six weeks. However, other tractor mounted equipment using special alloy steel treads have obtained up to five times this life, and it is believed that as soon as alloy treads can be obtained for the HD-5s the condition will be corrected.

Diesel Truck Haulage

In the haulage department, experiments have been conducted with several makes of trucks and types of

bodies, and most were found to be quite satisfactory. The Dart, 10-ton, rear dump unit powered by either a 100-hp. Cummins or a 135-hp. General Motors diesel engine was selected for use in the Kenoyer. From the loading point, trucks operate over graveled roads to the shaft where they discharge into a 50-ton loading bin.

Natural ventilation is adequate for all purposes, but at the truck turn around by the shaft is a dead end where considerable idling of motors takes place while trucks wait and dump. A more than normal amount of exhaust fumes accumulate, so an eight-inch Buffalo blower was installed at this point to provide fresh air.

Prior to the change to truck haulage, Eagle Picher employed what was then considered a most efficient "tail rope" system which consisted of an endless cable moving a train of cans on cars. The trucks have cut the tail rope cost about 40 percent.

Use Excess Oxygen

Diesel engines underground are all equipped to eliminate carbon monoxide entirely and ventilation keeps carbon dioxide gas, smoke and fumes well below the point where they would become dangerous to health or create undesirable working conditions.

Each diesel powered unit carries an oxygen cylinder with it. Pure oxygen is piped to the exhaust manifold of the engine where it mixes with the escaping gases and assures 100 percent combustion. Every trace of carbon monoxide is eliminated. The tractors consume about one-half cylinder of oxygen per shift and the trucks use a full cylinder. It is believed that this is about twice as much as is required to afford complete combustion, but the large excess is used to assure complete safety for workmen.

Kansas, Missouri, Illinois and Oklahoma, where Eagle Picher operates, as well as a number of other states have approved diesel engines for underground use.

Left: S. S. Clark, general mine superintendent for Eagle Picher, is recognized throughout the industry for his pioneering of mine mechanization that has made radical and basic changes in the technology of mining in the Tri-State district. Center: Frank J. Cuddeback, assistant general mine superintendent, originated and designed the shuttle car with automatic bumper used for spotting cans at the shaft. The device saves manpower and speeds hoisting. Right: Bert Paul, mine superintendent of the Kenoyer mine which was recently acquired and completely re-equipped by Eagle Picher so that it embodies all of the latest Eagle Picher developments for high-speed, low-cost operation.

Hoisting Also Speeded

Only two changes in hoisting practice and equipment were necessary to accomplish a major speed up at this point.

First was the elimination of the endless number of cans trammed to the shaft and the substitution of a loading pocket just above the haulage level. Under the old system it would have taken about 400 cans of 2,000 lbs. capacity to handle the output. The Kenoyer uses only four, two at each shaft. Cans are loaded through manually operated gates, hooked onto a free swinging cable and raised by a high-speed single drum hoist. An unexpected development was the rapid crystallization of the bails on the cans. Constant flexing caused them to break in a relatively short time, so it has been made standard practice to change bails every 30 days regardless of their apparent condition.

The second hoisting change was the installation of an automatic shuttle car and bumper arrangement at the foot of each shaft for spotting the cans mechanically. The device, developed by assistant general mine superintendent, Frank J. Cuddeback, is essentially just a platform, large enough for two cans, mounted on mine car trucks and moved back and forth on short rails. The movement is actuated by a six-inch air cylinder.

When the platform is in the full forward position, the forward can is in the exact position for hoisting. The empty can lowered down the shaft is easily swung onto the back of the platform by the hooker. While the full can is being hooked and hoisted, a workman, known as the puller, opens the gate in the ore bin and fills the empty. The platform is then moved back and a bumper holds the newly filled can so that it is slid over the platform to the forward end. The platform is then moved forward again to spot the full can below the shaft, and the cycle is repeated.

The shuttle car device had the effect of reducing the hoisting crew to four men and removing all manual labor from what had been a heavy, if not back breaking, task. Its use is highly approved by the members of the hoisting crew, especially the hooker.

While at the time MINING WORLD visited the Kenoyer mine it had not been in operation long enough to make any really accurate determination of costs, it had shown savings of approximately 40 percent in haulage costs, 30 percent in loading costs and other economies that more than justify the system. Perhaps the easiest way to summarize the progress represented by the operation is to point to production figures. Tons per man shift at the Kenoyer are approximately three times as great as accepted normal production figures of the hand loading, electric mule tramming days of five years ago.

Left: Loading is handled by Tracto-Shovels mounted on Allis-Chalmers HD-5 tractors. The unit has loaded as much as 323 tons in a 7½ hour shift. Note the oxygen tank on both loader and truck. Pure oxygen admitted to the exhaust manifold insures reduction of carbon monoxide to the recommended permissible. Right: All haulage is with these 10-ton, rear dump Dart trucks. They are powered with 100-hp. Cummins or 135-hp. General Motors diesel engines, and the tank on the side delivers pure oxygen to the exhaust manifold to assure complete combustion of all gases. Because the turn around at the loading pocket is a dead-end, an eight-inch Buffalo exhaust fan is used to increase air circulation.

A view of Almaden. In the background is situated the mercury reduction plant. Noteworthy are the enormous tailing piles.

By Laureano Menendez y Puget

THE RICHES OF ALMADEN

Long one of the world's prime sources of quicksilver, Almaden will continue to provide mercury at a steady rate for many decades

PART II

The mining methods employed at Almaden offered no radical departure until the end of the 18th Century when the increasing width of the veins at depth made it necessary to discover new modes of exploitation. Already Don Martin Hoppensack had substituted masonry arches for wood which had been difficult to find in sizes large enough to hold the veins. Finally in 1803, Director Don Diego Larranaga initiated the method of working that carries his name and was pursued well into the 20th Century.

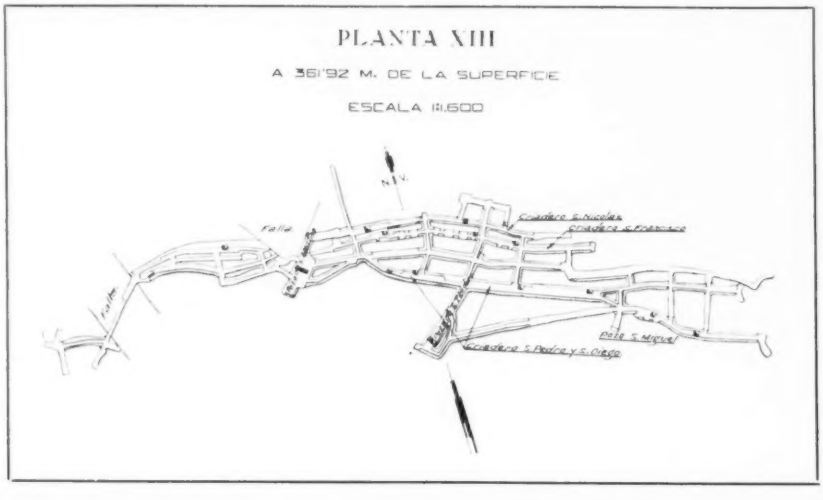
This procedure consisted, in general, of dividing mining into three cycles: The first, opening a drift following the direction of the vein; the second, widening the drive alternately until the walls were reached, and last, removing the rest of the ore. These last mining areas constituted reserves to provide the necessities of mining when circumstances required it.

The New Mining Method

The new mining method, devised in 1928 by Calvo Enriquez, a mining engineer, consists in beginning drifts in the veins, and while these are driven from one shaft to another with the necessary dimensions to permit the passage of mine cars, they are supported with light, inexpensive timbering. Accordingly, drifts are advanced and raises put up for ladderways and ventilation in the working faces, as well as for transferring ore to the level below.

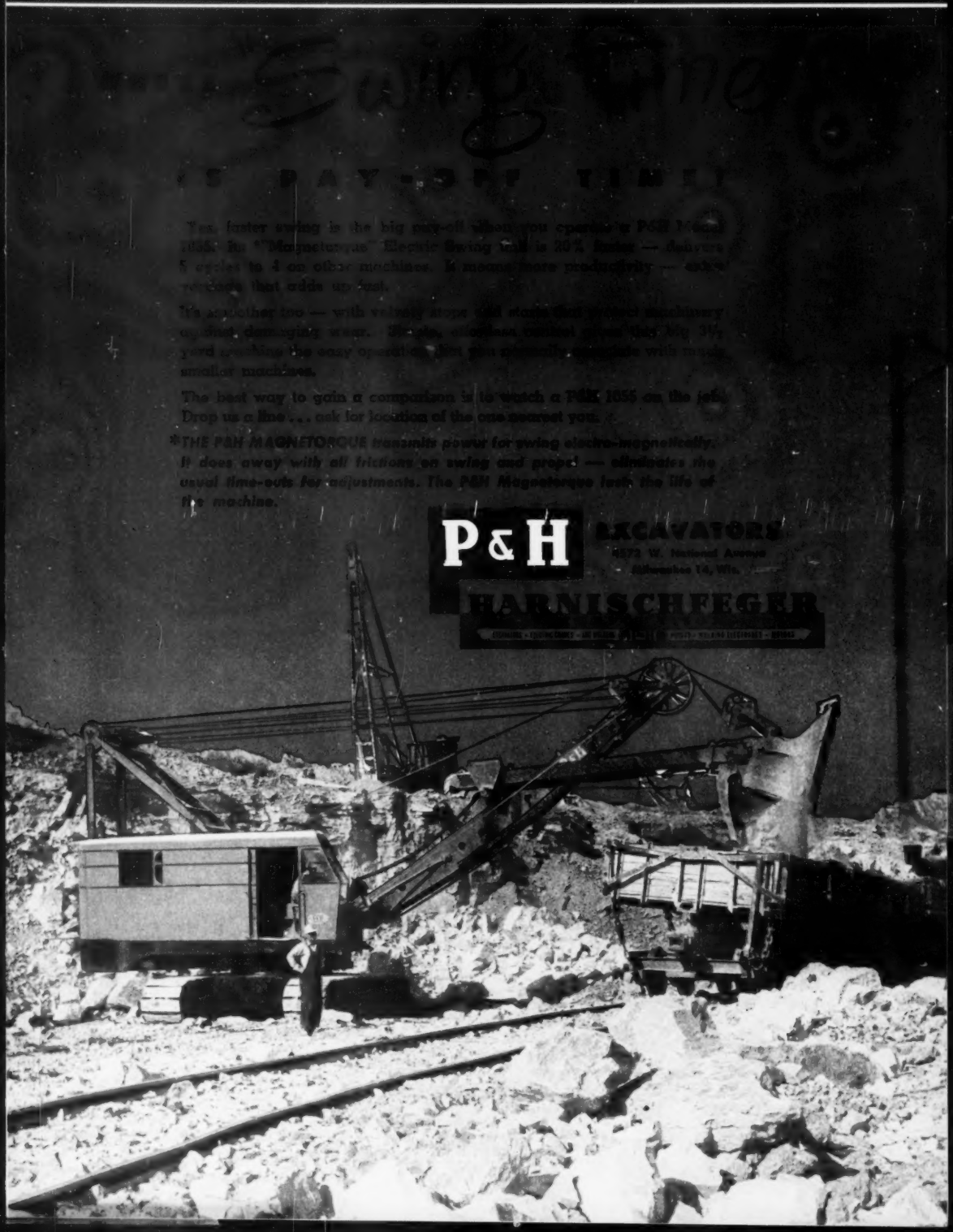
When a drift has advanced sufficiently for mining, it is widened to the walls of the vein. This done, mining begins on two faces or cuts until the total width of the vein is reached at a height sufficient to permit the construction of masonry arches which support the stope and serve as a new floor to continue the overhand stoping. These arches are not supported on the sides of the workings but on concrete sills set into the walls. In this form they constitute a true drift which is advanced as the first cut. Simultaneously, advances of the succeeding cuts are leveled with concrete constituting the new floor so that removal of the ore by overhand stoping can be continued. Above this masonry drift are constructed two sills. When the mining advance permits and they are supported on the walls below, the slices are removed successively until they arrive at the drift above.

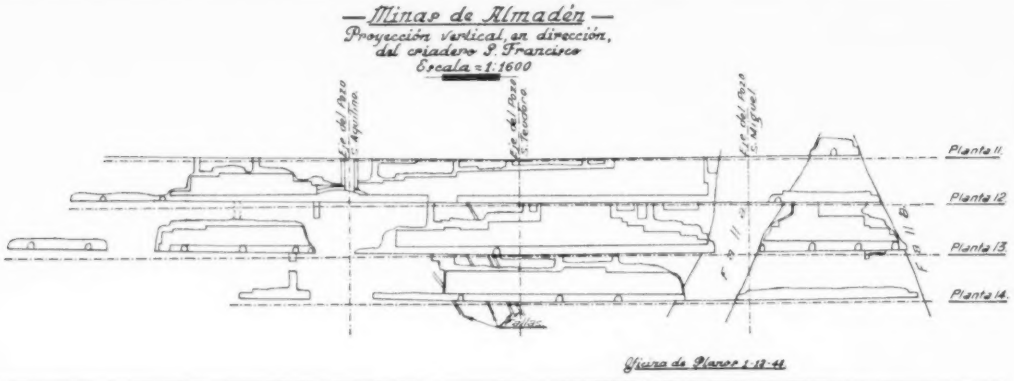
Actually, above the first level arches, mining and filling proceeds simply when the walls are firm or by constructing arches that catch the



Map of the 13th level showing the veins, crosscuts, shafts and the locations of the principal faults. Scale 1:1,600.

IT'S P&H FOR ADDED VALUES!





Vertical projection on the plane of the San Francisco vein. This shows stoping and fill between four levels.

ravelly walls. Afterwards, the stope filling is placed to allow openings necessary for ventilation and to transfer the broken ore from the stopes above to the hoisting shaft.

With these procedures, the costly and difficult operation of silling out is avoided because of the support offered by the masonry arches on the concrete sills. Also, stoping to the drift above eliminates inconvenience in removing the ore as well as fear of caving so that all the ore in the vein is easily won.

Compressed Air and Pumping

Drilling is performed with compressed air drills equipped with automatic feed and with articulated steel. As the quartzite of the veins is exceedingly hard, the latest models employ drills with hard metal points which are giving good results. Compressed air necessary for the operation is provided by two compressors, one of which is an Ingersoll-Rand, and both with 2,300 hp.

Two shafts, the San Aquilino and San Teodoro, are equipped for hoisting purposes with electric hoists of about 100 hp. each. From the San Miguel shaft, which is bottomed on the 13th level, a drift connects the other workings. Installed in the shaft is a fan of 200,000 cu. m. capacity per hour, aided by two other pure air fans in the other shafts. These fans force 150,000 cu. m. per hour through each auxiliary shaft. With this ventilation system, the temperature of the mine is agreeable, remaining a consistent 15 degrees centigrade.

Pumping water does not constitute a problem, with about 150 cu. m. daily sufficing for the operations.

Faults Limit Early Work

It was the belief of the Counts Fuggar and others in those days that the impregnation of sandstone by cinnabar was purely a local accident and had no relation to the manifestations of cinnabar that were observed on the outskirts of the area, including the town of Almaden. When they arrived at a fault, they limited their workings, feeling that it would not be worthwhile to attempt work at greater depths. Difficulties encountered in extracting the ore, pumping, etc., aided and abetted this decision, with the result that Almaden was mined over a length of some 500 meters to a depth of about 400 meters. Indications and manifestations of the existence of cinnabar appear on the other side of the faults, and during the construction of several buildings in the town of Almaden, mineral of excellent quality was uncovered.

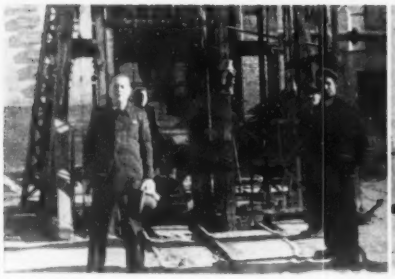
Diesel-generated electric power supplies the mine, reduction plant and townsite. This big diesel is shown in the modern powerhouse.

Solving Faults

In 1928, miners advancing in an easterly direction on the 13th level came upon a fault with a western throw which, in this zone, cut the upper levels of the veins. On seeing the strike of this fault, it was logical to suppose that the mineralization continued on the other side. Crossing the fault at a distance some eight meters from the San Diego vein, prolongation of the deposit was found; however, this proved to be not the San Diego but the San Francisco. The vein had taken a jump of some 10 meters to the south.

The importance of this find was great owing to the length of the veins. Subsequent work on the 11th and 12th levels proved the prolongation of the veins with a corresponding fault throw, and another fault was encountered with a contrary direction which joined the first at the 10th level and continued on. Consequently, it may be said that there is proof that almost assures the prolongation of completely virgin veins in this location from the 10th level to the surface. On the 14th level of the San Diego, the vein was found completely mineralized and cut by the chalk.

In the western part of the San Aquilino shaft another fault exists, and here the veins tend to unite. This fault, which has passed through the lower levels, is believed to be the same that the Fuggars encountered in advancing their workings to the east. Some 50 meters distant there is an-



Right: The San Aquilino shaft and headframe and the house of the Counts Fuggar.

Left: Close-up of the San Teodoro shaft showing a skipped car and detail of the headframe. The author stands at the left.

cther fault, now being crosscut. It is thought that beneath the workings of the Fuggars, which reached a depth of some 200 meters over a vein length of 500 meters, to the first fault east of the San Aquilino shaft, the territory has been unexplored. On the assumption of a depth of 200 meters to the 14th level, more than one million cu. meters is delimited, representing a quantity of mercury sufficient to assure production at the present rate for more than 100 years.

Possibilities of Development

The following data give credence to the belief that this ore remains beneath the workings of the Fuggars:

The first is that the distance from the point of departure of the Fuggars' workings to those that are being worked today represents the maximum stoping area. This area is culminated where the past and present workings converge in an easterly direction on the vein that intersects the workings. Exploration drifts pushed to the west have ascertained the existence of ore. Also, in the lower levels, from the eighth to the 14th level, the three veins tend to unite and join at the fault where they constitute the only vein the Fuggars worked and which was called The Vein.

The deficiency of the metallurgical processes in the times of the Fuggars was such that only the zones of exceptional richness were mined, as the mining system demanded a yield of one quintal of mercury for each two of ore. What was considered lean ore gave a quintal of mercury for each four of calcined material.

With present preparations under way between the 12th, 13th and 14th levels, sufficient ore is available for 10 years of operations at the present output. Meanwhile, investigations may well find ore between these veins as well as on the other side of the faults and by deepening the shafts.

Exploration

Exploration may be grouped in three categories: The other side of the faults, at depth in the extension of the veins and in the upper level which were not exploited in past times, and outside the limits of the known zones.

In the eastern part on the other side of the faults, exploration is about to begin, while in the western part, it is already under way with good results reported.

Regarding recent exploration at depth, a 25 meter winze has been put down above the San Diego vein proving the persistence of mineralization, with the same tenor as that in the upper levels. The development of this level will provide ore for an additional 10 years.

Some raises have also been started to explore undeveloped veins from the upper levels. These new raises will facilitate mining, while a drift from the shaft will open to development sections of the vein without the difficulty of driving through old blind workings or those in poor condition.

With reference to exploration outside the working zone, there are a series of ancient workings of great interest principally between Almaden and Almadenejos where exploration will soon begin.

Smaller Mines

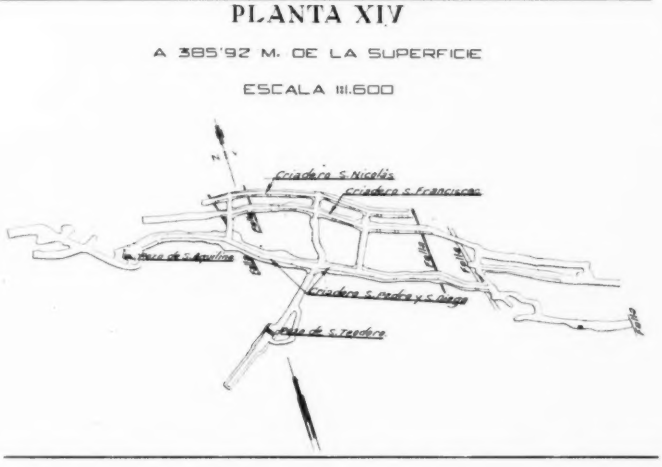
In Almadenejos about 11 kilometers from Almaden is the Concepcion mine which was worked from 1794 until the last third of the 19th Century. Figures taken from old records dating from 1794 to 1850 have revealed a production of 189,489 flasks of mercury for an annual average of 2,870 flasks. Recently, the main shaft was unwatered to a depth of 100 meters and pumping stopped at this point so that a 50-meter crosscut could be driven. The mine is known to have substantial quantities of native mercury.

Some 18 kilometers from Almaden is the Valdeazogues mine on the bank of the Valdeazogues River where development reached a depth of 70 meters. From its discovery in 1829 until 1850, the mine produced 8,139 flasks for an annual average of 387 flasks. At present no investigation is under way.

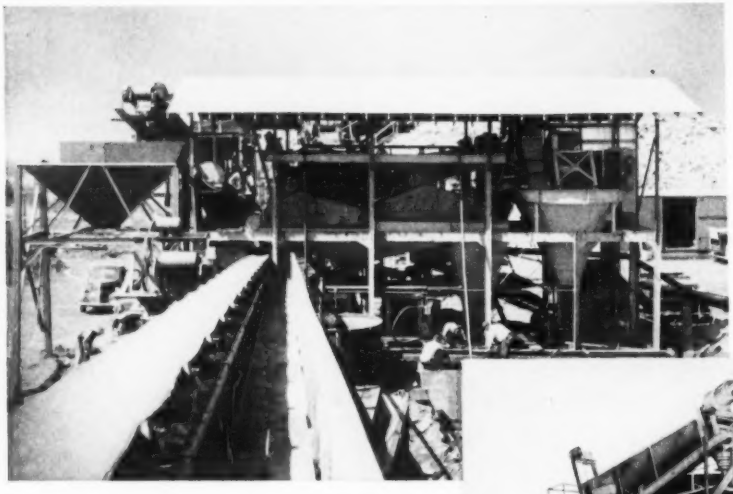
In 1850 the Concepcion and Valdeazogues employed 400 workers. The ore, however, was not of a very high tenor, with an average mercury content of less than one percent.

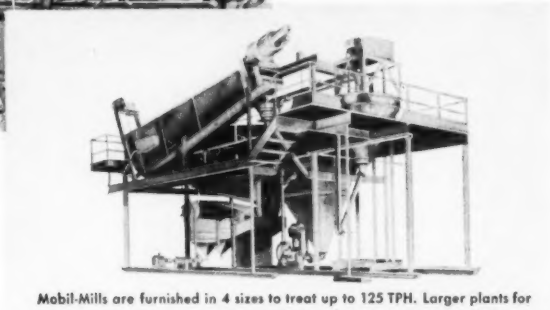
The mines of Entredicho, which are nearby, produced only 47 flasks between 1833 and 1850; however, native mercury was found in such large quantities that the workers were paid 1.50 pesetas per half liter collected. No exploratory work is under way here at this time.

Map of the 14th level, which indicates that development has not progressed as far as that on the 13th. Only the San Teodoro and San Aquilino shafts are shown on this plan, that of San Miguel not having been driven to this level.



COMPLETE PRODUCTION PLANTS TO ORDER . . . NOW





Mobil-Mills are furnished in 4 sizes to treat up to 125 TPH. Larger plants for any tonnage requirement can be supplied in a relatively short period of time.

- For operators who want RESULTS TODAY —with MINIMUM CAPITAL INVESTMENT— the Mobil-Mill offers a sound, simple solution.

- The WKE (HMS) MOBIL-MILL PRODUCTION UNIT can be installed, ready-to-operate in one week after delivery at the job site.

- Available for shipment in 3 to 6 weeks (deliveries are often made from stock), complete Mobil-Mill plants provide operators with the most efficient and lowest cost method of coal cleaning and mineral beneficiation—the Heavy Media Separation process.

MORE THAN 10 MILLION TONS PER YEAR (rated capacity) are now being handled by WKE (HMS) Mobil-Mill units. All ores amenable to heavy media separation can be treated by Mobil-Mills. A few of the ores now being treated are

COAL	**BASE METALS**
IRON	**BARITE**
FLUORSPARS	**ROCK AGGREGATES**

For full particulars consult the WEMCO office nearest you.

PRINCIPAL OFFICES

Los Angeles • Sacramento • Salt Lake City • Spokane
Pocatello, Idaho • Denver • Phoenix • Chicago
Hibbing, Minnesota • Bartow, Florida • New York

EXPORT DISTRIBUTORS

The Ore and Chemical Corporation
80 Broad Street • New York 4, N. Y.

Continental Europe and North Africa

Dr. Ing. Herbert Lickfett A/B, Stockholm 3, Sweden
Milieu Dense, Paris, France
Ferdinand Egeberg & Company, Oslo, Norway
Macchine ed Impianti Ing. Donati & Co., Milan, Italy
A. Schubarth & Company, Basle, Switzerland
G. Maltisiniotis & Co., Athens, Greece
Agence Miniere & Maritime, S. A. Antwerp, Belgium
Adil Gabay & Albert Koenka, Istanbul, Turkey

WEMCO
WESTERN MACHINERY COMPANY
760-768 FOLSOM STREET · SAN FRANCISCO 7, CALIFORNIA

WKE (HMS) Mobil-Mill • Coal Spiral • Standard Thickeners (HMS) Thickeners • (HMS) Media Pumps • Hydroseparators (HMS) Densifiers • (HMS) Separatory Cones • "SH" Classifiers Sand Pumps • Conditioner and Agitators • Fagergren Flotation Machines • Dewatering Spirals • (HMS) Laboratory Units

As mining looks to the future...

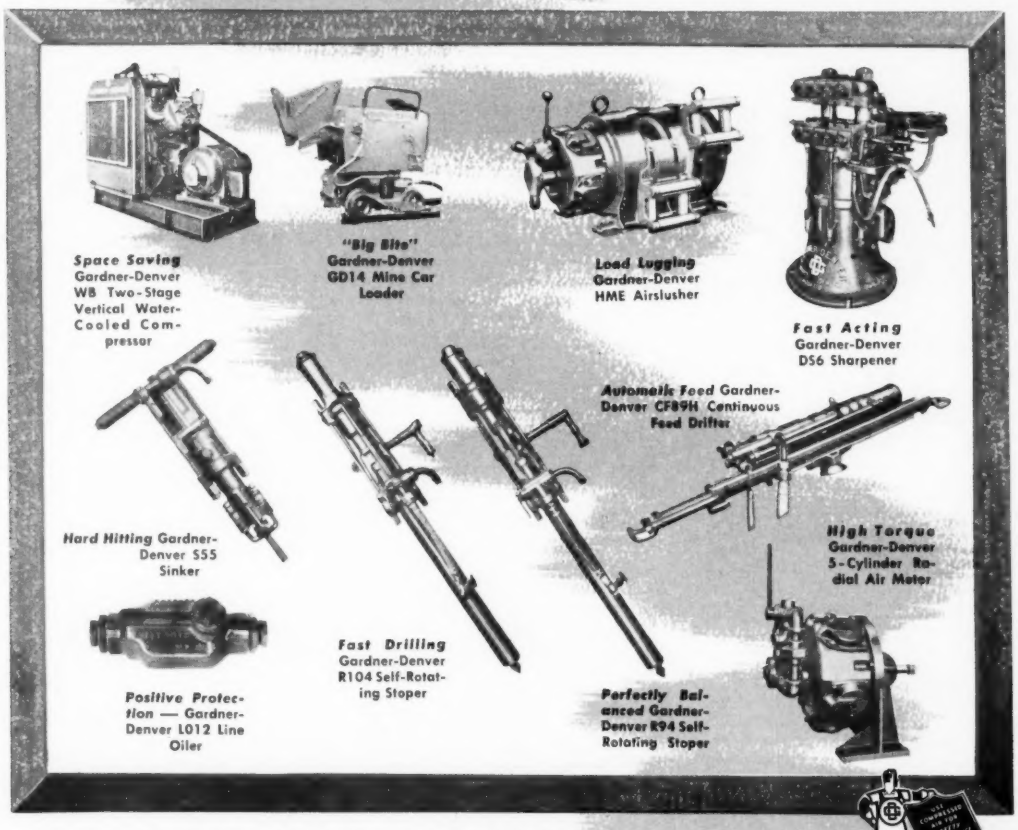
GARDNER-DENVER

keeps the pace!

Wherever the mines of tomorrow are located — whatever the mining methods — you'll find Gardner-Denver fine quality mining tools on the job. For throughout the mining world, Gardner-Denver equipment is famous for that extra measure of performance that often makes the difference between waste rock and pay dirt.

Gardner-Denver — familiar with problems of the constantly expanding mining industry — keeps the pace with new and improved machines that help you increase mining efficiency.

For further information on the popular Gardner-Denver models shown here, write us today!


Space Saving Gardner-Denver WB Two-Stage Vertical Water-Cooled Compressor
"Big Bite" Gardner-Denver GD14 Mine Car Loader
Load Lugging Gardner-Denver HME Airslusher
Fast Acting Gardner-Denver D56 Sharpener
Automatic Feed Gardner-Denver CF89H Continuous Feed Drifter
Hard Hitting Gardner-Denver S55 Sinker
Fast Drilling Gardner-Denver R104 Self-Rotating Stoper
High Torque Gardner-Denver 5-Cylinder Radial Air Motor
Positive Protection — Gardner-Denver L012 Line Oiler
Perfectly Balanced Gardner-Denver R94 Self-Rotating Stoper

GARDNER-DENVER Since 1859

Gardner-Denver Company, Quincy, Illinois

In Canada: Gardner-Denver Company (Canada) Ltd., Toronto, Ontario

Export Division: 233 Broadway, New York 7, N. Y., U. S. A.

PROMINENT MEN IN INTERNATIONAL MINING

Risto T. Hukki, professor of Mineral Dressing, Finland Institute of Technology; *Timo Heikkinen*, mill superintendent, Outokumpu, and *S. Huckaba*, mine superintendent, Outokumpu, all Finnish mining men, visited the metal mining districts of the United States during the late spring. Study of mine and mill plants was the object of their visit.

Mark C. Malamphy, formerly of Little Rock, Arkansas, and *William G. Garlick* of Lusada, Northern Rhodesia, have incorporated under the firm name of Mark C. Malamphy and Company, Ltd., Consulting Geologists and Geophysicists, with offices in Mufulira, Northern Rhodesia, P.O. Box 209. Malamphy has been engaged in geophysical prospecting in North and South America since 1926, and in South Africa, the Rhodesias and the Belgian Congo since 1946. Garlick has been engaged in geological investigations in South and Central Africa for over 20 years.

Alistair McKelvie, of the Imperial Smelting Corporation, Ltd., arrived in Australia in February.

George Hellerich, manager of the Gold Beach Dredging Company, operating on the Seward Peninsula near Nome, Alaska, recently returned to the property. He spent most of the winter in California. Last year Hellerich was manager of the Brinker-Johnson mine on Caribou Creek.

Roy Robertson was elected president of Stadacona Mines, Ltd., Montreal, Quebec, succeeding *B. M. Hill*, who has resigned. *W. R. Anderson* is now vice-president in Robertson's place. The company has extensive gold properties in the Rouyn, Quebec, area.

Dr. G. S. Hume, chief of the Geological Survey of Canada, has been made director of the Mines, Forest and Scientific Services Branch, which post he will take over when *W. B. Timm*, the present director, retires. Hume has been with the department for 28 years. He is a graduate of the University of Toronto and Yale.

Marcell Stirn, manager of the Havenstrite Mining Company's Mud Creek operations, Candle, Alaska, who has recently been in Los Angeles, has returned to Candle to open operations there. With him was *George Butler*, accountant for the Los Angeles branch. *Jack Allen*, superintendent for the company, has also returned after a southern California trip.

Leif Ostnes, one of the owners of Johnson and Ostnes Mining Company, has returned to the Marshall area, Alaska, for the mining season.

Ken Cole is in Platinum, Alaska, with the Goodnews Bay Mining Company.

Welland Gemmell is Canada's new Minister of Mines, a position heretofore held by Premier *Leslie M. Frost*.

John Worcester has been made production manager of the National Lead Company, S. A., at Av. R. Saenz Pena 567 (R. 93), Buenos Aires, Argentina. He had been in mining and geological activities in Massachusetts.

Ralph Hayden, on leave of absence as mill superintendent, Copper Canyon Mining Company, Battle Mountain, Nevada, has been succeeded by *Harry Glover*.

Otto Herres, vice-president, Combined Metals Reduction Company, Salt Lake City, received a Medal of Achievement from the Colorado School of Mines on Commencement Day, May 27.

J. H. D. HARGRAVE, superintendent of the smelting department of The Consolidated Mining and Smelting Company, Trail, British Columbia, has returned recently from Australia after studying lead smelter designs in connection with the company's new $12,000,000 revision of their lead smelter at Trail.

W. T. McGinnis, former chief of the War Assets Administration's industrial property division in the Northwest, has been named manager of the Chromium Mining and Smelting Corporation's Mead plant at Mead, Washington. The Montreal firm, which leased half of the war-born magnesium plant several months ago, is conducting ferrosilicon and ferrochrome operations.

Stanley M. Lane, metallurgist at the East Helena, Montana, plant of the American Smelting & Refining Company, has been appointed assistant superintendent, succeeding *Frank C. Moran*. Moran, who is a graduate of the Montana School of Mines, left recently for Australia, where he will be superintendent of Mount Isa Smelting, Ltd., an AS&R operation. Lane has been on the staff at East Helena since his graduation from MIT in 1935.

Dr. Wilhelm Kegeil of Munich, president of the German Geology Society and supervisor of the geological mapping of Europe, has joined the National Department of Mineral Production to do field work in Brazil. Other prominent geologists who have joined the Department are: *Dr. Karl Beurlen*, professor of stratigraphy and paleontology in Munich; *Dr. Valto Volthein*, Finnish geologist, specialist in Cryptozoic areas; *Dr. Heinz Ebert*, German petrographer; *Dr. Robert Greenwood*, English geologist, specialist on detritical deposits: *Dr. H. Stahl*, German geologist, specialist on metalliferous deposits: *Dr. Hans Muller*, German coal expert; *Dr. Hans Putzer*, German underground water expert; *Professor Hans Peter Mojen*, German specialist on fuels and synthetic petroleum. It is reported that the Technological Institute of Minas Gerais also is interested in making contacts with foreign geologists, primarily displaced persons from Europe.

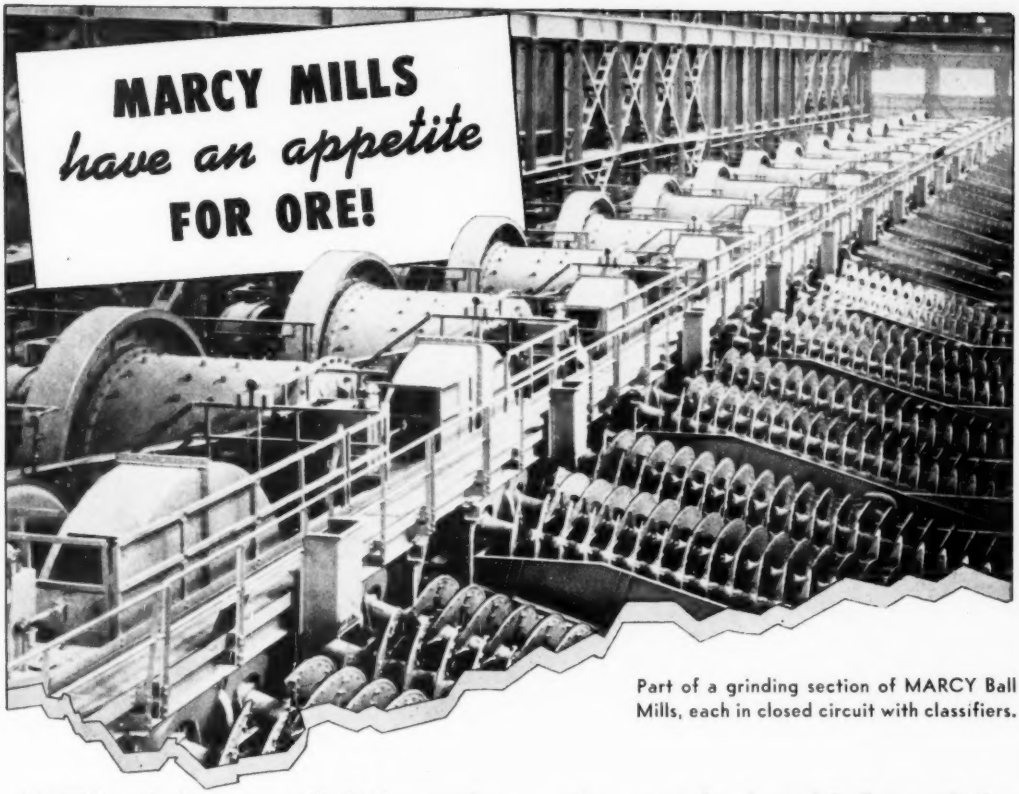
D. G. Armstrong was recently appointed metallurgist to the Colonial Development Corporation, it was reported from London.

R. J. Agnew, director of Lake View and Star, Ltd., operating in Western Australia, was welcomed by J. F. Thorn, general manager, when he arrived in Freemantle on a visit to Australia.

Kenneth C. Brownell, formerly executive vice - president of the American Smelting & Refining Company, was elected president at the company's annual meeting, succeeding *H. Y. Walker*, who retired after 52 years of service.

P. E. Mehta is now in India working for The Tata Iron and Steel Company's general office at Jamshedpur.

MARCY MILLS *have an appetite* FOR ORE!



Part of a grinding section of MARCY Ball Mills, each in closed circuit with classifiers.

MARCY mills have unusually high capacity because of the low pulp line grate discharge which is basic to MARCY design. In many cases this means up to 50% greater capacity than is possible with conventional trunnion overflow mills.

Sectional slotted grates permit quick discharge of the finished product without overgrinding. The resulting low pulp line makes possible faster circulation of mill contents, use of a thicker pulp, and maximum efficiency in permitting the balls to exert the full force of their weight in actual grinding work.

MARCY design thus results in production of more mesh tons per horsepower than the same size overflow type of unit. Because the grates are made of special alloy steel, they have a life in excess of liner life. The liners are also of alloy steel to withstand the action of the balls in the low pulp line mill.

In installations with a daily capacity of 300 tons or less, secondary crushers are often omitted; MARCY mills provide one easy step from primary crusher to finished product. For larger tonnages, secondary crushers are used to give a ½" or ¾" feed to the MARCY ball mill.

For any grinding application, MARCY mills are worthy of your full consideration for maximum capacity and economy in ore beneficiation. Permit our engineers to consult with you on any grinding question.

Denver, El Paso, Salt Lake City, 1775 Broadway, N. Y., Canadian Vickers, Ltd., Montreal; W. R. Judson, Santiago & Lima; The Edward J. Nell Co., Manila, P. I.

Massco Fahrenwald Flotation Machines; Genuine Wilfley Tables; Massco-McCarthy Hat Millers; Rock Bit Grinders; Density Controllers; Belt Feeders; Pinch Valves; Assay and Laboratory Supplies and Equipment; Complete Milling Plants; Constam Ski Lifts.

The **Mine & Smelter** Supply Co.

OCEANIA

NEW CALEDONIA—Statistics on nickel production during 1948 have been released showing that production of the metal remained stationary —96,400 tons against 90,220 tons in 1947; chromium was better, going from 50,530 tons in 1947 to 75,020 tons in 1948. Matte production in 1948 was 2,210 tons and ferro-nickel was 4,050 tons.

QUEENSLAND—On the beaches south of Brisbane, several mining syndicates have been recovering good values in zircon, rutile and ilmenite. The companies bulldoze the overburden aside, then mine the mineral bearing sands which are finally treated at nearby works. In the past eight years around 600,000 tons of concentrates worth close to £750,000 have been recovered.

BORNEO—In order to help supply the large British aluminum fabricating industry, continued discussion is being carried on by the *British Aluminum Company* toward solving the many problems of establishing an aluminum plant in North Borneo. A large amount of money, adequate electric power and nearby supplies of raw materials will be necessary.

TASMANIA — *Electrolytic Zinc Company of Australasia, Ltd.*, which last year evolved a bonus plan for employees based on dividends paid to stockholders, announced through W. C. Snow, general superintendent, that no such plan would go into effect based on price and output of zinc. At the *Risdon* and *Rosebery* mines last December the bonus based on dividends amounted to £A78,000, 29 percent of the amount paid to stockholders.

PHILIPPINES—*Atok-Big Wedge Mining Company, Inc.*, at Baguio, Mountain Province, is examining and prospecting three groups of chromite claims located on Dinagat Island, Province of Surigao, Mindaneo. The claims contain high grade deposits of chromite but the size and extent of the orebodies has not been determined yet, so development has not begun.

TASMANIA — The Australian Government's £3 million aluminum production project will be established at Bell Bay in the Tamar Valley of northern Tasmania. Tamar river is navigable as far as Launceston and shipping from there to Melbourne has gone on for many years for export of northern produce, thus removing any transportation obstacle for the aluminum project. According to plans, a plant will be installed at the mouth of the Tamar and will have an initial capacity of 13,000 tons a year, increasing eventually to 25,000 tons a year. Bauxite will be imported at first from other countries, but, after the project is completed, officials hope to use Australian bauxite exclusively. Development of port facilities at Bell Bay will be carried on later also.

NEW SOUTH WALES—Production has been resumed at *Lake George Mines*, Captain's Flat, after a seven months' strike.

QUEENSLAND — A rich copper deposit has been reported by Ray W. Young, who discovered the ore while working on a road at Biloela, Central Queensland. Young has staked seven claims on the property. Other copper reefs have been found in the same area before.

TASMANIA—New deposits of bauxite have been located by the Department of Mines in the Swansea and Midland regions.

TASMANIA—*Mount Lyell Mining and Railway Company* mined more ore in the quarter ending March 31 than for the previous quarter, but overall production for both quarters was down. The directors decided on the cautious policy of examining the full year's accounts before declaring a dividend.

SOUTH AUSTRALIA — Messrs. Craigie and Evans are holding ten claims totalling 400 acres on an abandoned lead field in the Barratta-Eukaby district, about 350 miles northeast of Adelaide. Surface veins assayed 83 percent lead and 53 ounces of silver to the ton. Diamond drilling is necessary to test the claims thoroughly, and the prospectors are hoping to interest capitalists. The nearest town is Waukeringa, once noted for gold; Mt. Painter, uranium center, is fifty miles distant.

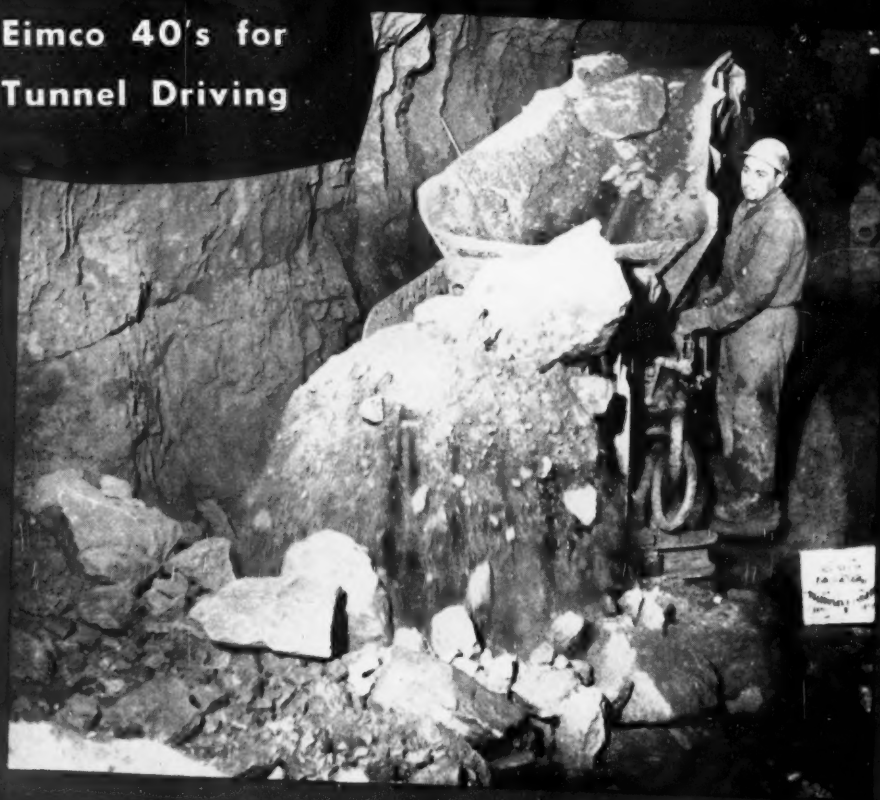
AUSTRALIA—Current Australian output of refined tin is little above the lowest point reached during the depression of the 1930's. Australian consumption of ingot tin during 1948 was 2,391 tons, and production had to be supplemented by the import of 459 tons. Australia is no longer self-sufficient in tin, and unless local tin mining receives an impetus, the deficiency is likely to become worse in the near future.

AUSTRALIA—The United Kingdom Ministry of Supply has increased the price of beryl ore to £A8.2.6 per long ton unit of BeO, packed in sound bags, delivered f.o.b. at main Australian ports. The ore must contain not less than 95 per cent BeO. Full payment will be made on weights and assays determined in Australia prior to shipping.

BROKEN HILL, AUSTRALIA

Some of the world's richest silver-lead-zinc mines are at Broken Hill, an Australian mining camp 670 miles west of Sydney, New South Wales, and 350 miles northeast of Adelaide, South Australia. The camp has a population of 28,000 and from the discovery of the Silverton field in 1881 to 1945, 62,700,000 tons of ore has been raised from the orebodies, the value of the output being £A210,500,000. Declared dividends exceeded £A50,000,000 and no end is yet in sight. Employes of the Broken Hill enterprise are the highest paid workers in Australia, thanks to the payment of a lead bonus of up to £A8 weekly which is adjusted according to the price of lead. More than 3,500 men are employed in the mines but the enterprise is singularly free of industrial trouble because of the good relations existing between management and unions. Shown above are the two operating headframes of the Zinc Corporation mine. At left is the main shaft headframe, used for transporting men and ore, and at right is the Block 5 headframe, used principally as a service shaft.

Eimco 40's for Tunnel Driving



The Eimco Model 40 RockerShovel is the machine to use for fast, efficient and economical removal of broken rock in your tunnel headings.

Model 40's have been instrumental in the successful completion of many tunnel jobs and in lowering the cost of development and production in many mines.

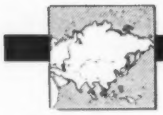
These machines are equipped with four powerful Eimco Air Motors, one for each of the four functions: Bucket, locomotion, swing and conveyor.

The heavy-duty Eimco RockerShovel loads the conveyor while cars are being switched, eliminating lost time during the switching operation. When the car comes in and is automatically coupled, the conveyor is started. Time required for loading a 2 ton car has been cut to less than 30 seconds.

Figure Model 40's in your work to be sure to be able to get the job and make more money.

Write for information on loading costs using Eimco RockerShovels.

EIMCO



ASIA

TURKEY — Late advice indicates that a trade agreement is being considered by the Turkish Government and Stockholm. Sweden will exchange steel and machine tools for chromite and other raw materials.

MALAYA — Compared with the like month of the previous year, output of tin in cassiterite — converted at 75.5 percent — for March was up about 40 percent. Production for March, 1948, was 3,456 tons, and for March, 1949, 5,006 tons. During February, 1949, the output reached the figure of 3,454 tons.

INDIA — According to a Delhi source, additional reserves of manganese have been discovered in the Balaghat district of the Central Provinces by a party of Indian geologists. The area already is an important manganese producer. No details of the new discovery have been made public.

MALAYA — Tin shipments suffered a blight during April, declining to 3,676 tons from the March figure of 4,606 tons. The figure for April of last year was 5,879 tons. April shipments totaling 2,456 tons were loaded at Penang, distributed as follows: U. S., 1,400 tons; Canada, 100 tons; India, 936 tons; with a total of 20 tons distributed among European countries and South Africa. Singapore loadings totaled 1,200 tons, divided as follows: U. S., 600 tons; Europe, 500 tons; Australia, 60 tons; South Africa, 50 tons, and the Pacific, 10 tons.

JAPAN — Imports of manganese ore in Japan, suspended since the end of the war, have been resumed, amounting to nearly 9,000 tons in December, 1948. During the pre-war period imports of manganese ore were estimated at approximately 105,000 tons for 1930, thus a greater amount apparently is going to Japan than was consumed during that normal peacetime year, although manganese shipments amounted to over 230,000 tons in 1937.

INDIA—Mining machinery valued at approximately Rs. 5,000,000 is expected to be installed shortly at Hutti, Raichur district, Hyderabad, to reopen old gold mines, as part of an authorized Rs. 10,000,000 to revive the gold mining industry of the state. Operated for centuries, the Hutti mines were abandoned more than 30 years ago when it was thought that the gold ore was exhausted. Surveys made many years later indicated that paying ore was still available in the district.

TURKEY—Marshall Plan funds in the sum of $1,000,000 have been allotted to Turkey for the development of the *Divrik* iron mines in eastern Turkey. Plans call for the increase of output from 150,000 to 600,000 tons yearly in 1952. The funds will be expended to purchase earth-moving machinery necessary to strip a substantial depth of overburden.

INDIA — Mica mining has been started again in Hyderabad after a shutdown brought on by disturbed conditions. The principal mica producing district is about 35 miles east of Khammamet.

INDIA—The first vermiculite ever discovered in India recently made news when it was announced that the mineral had been discovered in six areas of Mysore state. The government is arranging to examine the deposits.

LATIN AMERICA

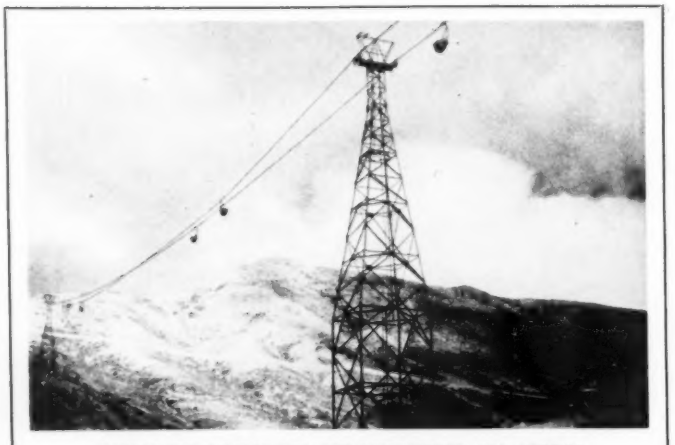
CHILE—The *Bethlehem Chile Iron Mines*, a subsidiary of the Bethlehem Steel Corporation, and *Cia. de Acero del Pacifico* recently signed a contract whereby Bethlehem will supply Pacifico with iron ore at cost for a 20-year period. Under this agreement, exploitation of Bethlehem's *El Romeral* iron deposits is to begin within three years, involving $9 million for the construction of railway and port facilities, housing, and the installation of machinery. Of this amount, Bethlehem will contribute $6.5 million and Pacifico the remainder.

BRAZIL — Superphosphate consumption in Sao Paulo has increased considerably over a year ago, comparative figures being 19,000 tons and 32,800 tons. Interest in mining phosphate rock shows an increase with the principal deposits lying in Araxa, Minas Gerais, where a reserve of about 100,000,000 tons is said to occur. Average phosphate content of this deposit is 32.6 percent P_2O_5, with limonite and calcite occurring as minor impurities. Other important deposits are found at Serrote, Jacupiranga and Ipanema, Sao Paulo.

CHILE — Cia. Minera Bellavista, operating near San Felipe, Province of Aconcagua, expects to start concentrating zinc ores soon. A flotation plant, under development for some time, will be employed. The Bellavista is a former gold producer.

VENEZUELA — Diamond production for 1948 set a record of 75,513 carats, compared with 61,634 carats in 1947. Indications are that production for 1949 will be sustained at near 1948 figures.

BRITISH GUIANA — Recently announced was the formation of a



NEW TRAMWAY COMPLETED IN PERU

A vital link in the 100-mile system of transportation to Cerro de Pasco Copper Corporation's new mine at Yauricocha, Peru, has been completed by the installation of a Roebling Monocable Tramway. Designed and manufactured by John A. Roebling's Sons Company, Trenton, New Jersey, the tramway runs for ten miles over mountainous terrain, gouged with gorges and ravines, where no other means of mechanized transport is feasible. It is one of the highest tramway installations in the world, rising to an elevation of 15,500 feet.

new company in partnership with the Demerara Bauxite Company, Ltd., with the object to develop the bauxite deposits of the country.

BOLIVIA—Following the trend of Bolivian tin exports for the last few months — 1,989 tons in February — it is reported that shipments have declined still further.

BRAZIL — Resumption of operations at the Itupeva wolframite deposit, an important source of tungsten during the last war, has been announced recently. Tin is an associated metal. The deposit is in the State of Sao Paulo.

VENEZUELA—Iron ore shipments from the Mina del Pao in the State of Bolivar, where the Bethlehem Steel Corporation is opening up an open pit mine, should begin towards the end of the year, according to recent advice received from Venezuela. Moving the ore will involve rail transport for 32 miles from the mine to Palua, near San Felix on the Orinoco River, from where it will be moved by barges on the Manamo River to Guiria, a deep water port on the Gulf of Peria, Province of Sucre.

ARGENTINA—A trade agreement recently consummated between Argentina and the three Western zones of Germany provides for transfer to Argentina of iron and steel manufactures, machine tools and electrical goods. The agreement runs until March, 1950.

PAUL B. ENTREKIN, former vice-president and general manager, Bethlehem Chile Iron Mines, El Tofo, Chile, has been appointed general manager, Mining Division, Bethlehem Steel Company.

AFRICA

MOROCCO—*Rif Mines Company* at Melilla produced 217,200 tons of iron ore in the first quarter of 1949, 25,200 tons more than the same period in 1948, and shipped 218,600 tons. Production during the entire year of 1948 was 755,500 tons and shipments amounted to 758,000 tons.

SOUTH AFRICA—The Mine Workers' Union and Dr. A. Hertzog, M. P., have suggested that the gold mining industry in South Africa be nationalized. The miners feel a thorough inquiry into nationalization should be carried on in an effort to solve the problems of the industry, with State subsidizing a possible last resort. Dr. Hertzog feels that the government could run the mines as well as private individuals, many of whom hire experts to run their mines and therefore need to know little about mining themselves.

SOUTH AFRICA — The railway administration has recently speeded up the transporting and loading of manganese ore for export by making 70 extra trucks available to the mines and one coal dumping plant at Durban has been diverted to manganese loading. Ships are now able to load ore from two berths of the port and bookings of space aboard them has increased noticeably.

LIBERIA—Purchase of a stock interest in the *Liberia Mining Company* has been announced by Republic Steel Corporation, New York. Liberia owns extensive deposits of high grade iron ore located around 45 miles northeast of Monrovia, capital of Liberia. Construction of a railway to haul the ore to Monrovia docks is under way and will take two more years to complete.

UGANDA—*Frobisher, Inc.*, of Toronto, Ontario, Canada, announces that the company's *Kilembe* copper-

AMERICAN SMELTING AND REFINING COMPANY

Has Always Offered an Unfailing Market for

GOLD . . . SILVER . . . COPPER . . . LEAD . . . ZINC

Ores . . . Concentrates . . . Bullion . . . Precipitates . . . Furnace Products

For Schedules, Freight Rates, etc.
Write to Your Nearest Office

405 Montgomery Street
San Francisco 4, Calif.

P. O. Box 1111
El Paso, Texas

700 Pacific Nat'l Life Bldg.
Salt Lake City 1, Utah

810 Valley Bank Building
Tucson, Arizona

Tacoma 1, Washington

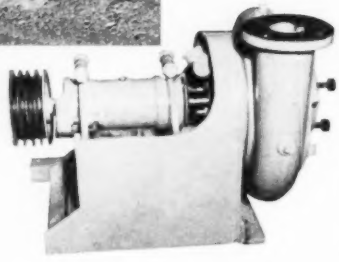
East Helena, Montana

607 First National Bank Building, Denver 2, Colorado

AMERICAN SMELTING AND REFINING COMPANY

3404 HOURS CONTINUOUS, TROUBLE-FREE OPERATION

Yuba No. 20 placer dredging at Hammonton, Cal., is equipped with Model "S" pumps.



Model "S" 3" Yuba sand pump used for sand pumping on jig equipped placer dredge.

Actual Performance Record of Yuba Model "S" 8" Pump

Here's what the superintendent of a Yuba 18 cu. ft. bucket line dredge wrote us under date of Oct. 4, 1948:

"For your information, the Model "S" (8") mud pump #880 in operation at Dredge No. 4 on Sept. 30, 1948 had completed 3,404 hours of operation without trouble or repairs."

This same customer has since purchased another 8", Model "S", and he has in use several 3" and 6" pumps of the same type.

Yuba Model "S" pump is a centrifugal type, designed especially for dredging mud, sand, or muddy water encountered in placer dredging or excavating work. Special alloys are used in castings to ensure long life with minimum loss of time for repairs. Our aim in building pumps, as with all dredge parts, is to keep your dredge running—you profit only when it is operating.

You, too, can get higher running time by equipping your dredge with Yuba pumps. For full details, write or wire us NOW.

PLACER DREDGE OPERATORS AIM AT

1. High running time
2. High yardage
3. High recovery
4. Low operating cost

They get all 4 with Yuba bucket ladder dredges.

YUBA MANUFACTURING CO.

Room #710, 351 California St., San Francisco 4, California, U. S. A.

AGENTS { SIME, DARBY & CO., LTD. · SINGAPORE, KUALA LUMPUR, PENANG.
SHAW DARBY & CO., LTD., 14 & 19 LEADENHALL ST., LONDON, E. C. 3.

CABLES: YUBAMAN, SAN FRANCISCO · SHAWDARBCO, LONDON

cobalt property in Western Uganda, Africa, has shown encouraging results from the development work under way for the past year. Frobisher also has an interest in *Mediterranean Mines* of Thrace, Greece, a lead producing property at which development is progressing.

SOUTH AFRICA—An agreement was recently completed at Capetown between The Union of South Africa and the International Monetary Fund providing for the sale of the Union's gold at a premium above the $35 per ounce international official price, as long as that gold is semi-fabricated and sold to manufacturers. Safeguards to keep the higher-priced gold from moving into monetary channels were also drawn up.

SOUTH AFRICA—One of the biggest headaches for mine managements in recent years has been the serious decline in native labor available for work in the mines. By the end of last year the number of natives employed had sunk to 254,964, the lowest for many years. The April figure of 288,669 represents the biggest advance for many years. Employers fear that this advance may be only temporary and caused by such transient factors as the drought rather than indicative of more lasting trend.

PORTUGUESE AFRICA—Very encouraging surveys have recently been completed in the Portuguese African provinces, Angola and Mozambique. In Angola exploration reveals several million tons of high-grade manganese ore (40 percent silica content), large reserves of high-grade hematite suitable for open pit mining near the Cuanza River, Malanje, chrome deposits, quartz crystal, mica and asphalt. In northern Mozambique at Tete substantial amounts of titaniferous magnetite have been surveyed with the possibility of developing it for titanium or iron. Also at Tete fair-sized deposits of iron ore have been found, and in Zambezia copper deposits are thought to exist.

ORANGE FREE STATE—*Welkom* company, a member of the Anglo-American Corporation at London and one of the new operating companies of the Orange Free State, will raise £1,875,000 and may require another £2,125,000 before 1950 to finance its mines until they can go into production in 1951. At that time, 50,000 tons are expected to be mined per month.

MADAGASCAR—Recognizing the importance of graphite, the *Cie. Lyonnaise de Madagascar* has re-equipped and restored the graphite mines of Fanandrana in southern Tamatave. The mine workings were partially destroyed by the 1947 rebellion.

TUNISIA—The *Ste. Francaise du Bazina* and the *Cie. de Boleo* have combined under the name of *Omnium Minier du Boleo*. Ste. Francaise du Bazina works a lead mine in Tunisia.

EXCLUSIVE
Roll Type Throttle Control

EXCLUSIVE
Push Button Air Bleeder Valve

EXCLUSIVE
Cylinder Mounting for Positive Safety . . . Longer Service Life

NEW Thor SINKER LEG

45% MORE FOOTAGE AT FAR LESS COST!

Here's real savings in labor . . . man hours . . . and drilling costs . . . and 45% more drilling footage by actual tests!

The miner can carry the entire setup—Thor Sinker and Thor Leg—into the smallest tunnel or closest corner, set it up in an instant, start the hole . . . and then let Thor do the work! All he does is control the *constant pressure* feed by operating two simple throttles—*the only automatic controls in leg operation!*

Think of the savings . . . both in operating costs and air consumption. With carbide bits the Thor Leg can replace drifters—and heavy mountings on scores of heavy duty operations . . . can drift in tunnels where drifters won't fit. Write today for catalog data.

FULLY AUTOMATIC—A quick, easy setup—just start the hole—set the leg at any angle between 30 and 45 degrees. . the leg does all the lifting—all the constant pressure feeding . . . control the feed with a turn of the wrist!

INDEPENDENT PNEUMATIC TOOL COMPANY
AURORA, ILLINOIS
Export Division: 330 West 42nd Street, New York 18, N. Y.

Birmingham · Boston · Buffalo · Chicago · Cincinnati · Cleveland · Denver
Detroit · Houston · Los Angeles · Milwaukee · New York · Philadelphia
Pittsburgh · St. Louis · St. Paul · Salt Lake City · Seattle
San Francisco · Toronto, Canada · Sao Paulo, Brazil · London, England

Thor PORTABLE POWER TOOLS

PNEUMATIC TOOLS • UNIVERSAL AND HIGH FREQUENCY ELECTRIC TOOLS • MINING AND CONTRACTORS TOOLS

EUROPE

RUSSIAN ZONE — The big *Lauta Werke* aluminum reduction plant is undergoing repairs by the Russians. However, Germans in the zone fear the task will be difficult as supplies of alumina are scare. The electrolytic plant was partially demolished by the Russians at the war's end.

SWEDEN—An increase in production is planned by the *Kubikenborg Aluminum Works* in northern Sweden. The company hopes to put out 3,800 tons a year and later 8,000 tons a year. Production until now has been 1,800 tons.

ROMANIA—Reopening of the molybdenum mine of Rezbanya in Transylvania is planned, according to a statement by the Minister of Mines and Oil Production. The mine, which is owned by the state, was formerly worked during World War I when one to five percent molybdenum ore was won, with considerable amounts of 18 to 20 percent ore.

ENGLAND — Operations on the dumps of the *Wheal Basset* tin mine near Redruth are being continued under the direction of John Jeffers, managing director, and W. J. Furze, mill manager. A small company has also been formed recently to rework dumps and beach deposits at St. Agnes for the recovery of tin.

GERMANY—Production of aluminum in Bizonia has risen from 200 tons in January to 780 tons in February and 1,900 tons in March of this year. This increase was due to the resumption of operations by *Vereinigte Aluminiumwerke* at Luenen in February, resumption of operations by *Aluminiumwerk Rheinfelden* in the French Zone in March and improved electric power sources in Bavaria. The latter company is said to be producing an initial 250 tons monthly.

GERMANY—Partial operation of the *Wilhelmsburg* refinery near Hamburg has been reported. The company produced 2,000 tons of much-needed copper in March. The country has been producing enough lead and zinc for its needs, but is still importing copper.

BELGIUM—Raw steel production in this country is back to prewar production — 408,948 metric tons in March, an increase of approximately 50,000 tons over February output.

GERMANY — "*Huettenwerke Kayser*" at Niederschoeneweide is again producing secondary copper, brass, bronze, gunmetal, lead and light metals. One of the most important secondary smelters in Germany before the war, the plants at Oranienburg were completely removed and those at Niederschoeneweide partially removed during the war.

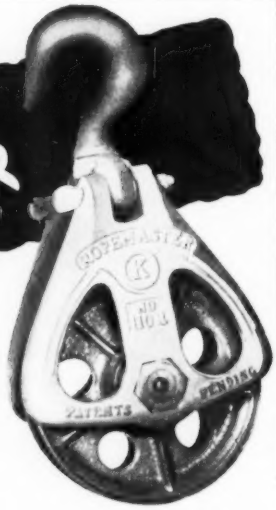
ENGLAND — The London Metal Exchange may reopen in July if pressure on the British Minister of Supply is successful. The Exchange has been closed because of the drop in American metal prices which left the British with large stockpiles of high priced ore bought during the bulk buying policy some time ago. The government would like to get rid of these stocks before buying again.

ENGLAND — A development program amounting to £1,000,000 is planned by the *Anglo - American Corporation*, London, on mining properties in South Africa and Australia.

AUSTRIA — A valuable discovery of asbestos was recently reported from Rottenmann, Styria. An estimated 4,000,000 Austrian shillings will bring the deposit into production. It shows good values and lies in a fairly accessible spot. Other deposits uncovered are too remote for development as yet. Most of Austria's asbestos has had to be imported from Italy.

ENGINEERED SLUSHER and MINING SHEAVE BLOCK

the ROPEMASTER



Now! A block that is engineered to do a better, faster job. The balanced Ropemaster block is the answer to your ore handling problems!

Features you can't match — All engineered in this improved block. Strut reinforced ear lugs, heavy alloy forged shackle give you top performance!

Streamlined sides, with latest Timken precision assembly, plus positive grease seal, assure smooth operation.

New, large alloy pin and tubiform rigid reinforcement help cut rope costs and speed up production.

All castings are electric steel with extra length for balance to give you the utmost in a balanced block. You can really save on cable costs, do a better, faster job with the Ropemaster. All sizes are now available.

Write for prices

Cate EQUIPMENT CO.
49 EAST 9th SOUTH
SALT LAKE CITY, UTAH

"I'm not much on figgers—but we had these two rot'ry dryers in the plant, a RUGGLES-COLES 'n another, 'n it jist seemed like we wusn't gittin' the work out o' the one of thim.

"I told the big boss about it, 'n he sent one o' his ingineers over to run tests. Well, you shoulda seen the look on this guy's face whin 'is figgers showed we wus burnin' a lot less coal per ton o' product in the RUGGLES-COLES.*

"Thim ingineers are on my side now. Whinever we add a new dryer to the set-up, they specify RUGGLES-COLES."

* Based on actual tests. Write for Hardinge Bulletin 16-D-4.

HARDINGE

COMPANY INCORPORATED

YORK, PENNSYLVANIA — 240 Arch St. • Main Office and Works
NEW YORK 17—122 E. 42nd St. • 205 W. Wacker Drive—CHICAGO 6
SAN FRANCISCO 11—24 California St. • 200 Bay St.—TORONTO 1

FOR SALE AT BARGAIN PRICES!

NEW AND NEARLY NEW MINING AND MILLING MACHINERY

DORR TURRET-BOWL CLASSIFIER — 12′ Bowl by 4 x 26′, complete with electric motors and drives.

SULLIVAN JUMBO—Complete with 2 Sullivan 3½″ Power Feed Drifters.

WEMCO SPIRAL CLASSIFIER—Single-pitch, 30″ x 16′. Serial No. 41-1689.

SOUTHWESTERN JIG—42″, complete.

(2) VACUUM PAN FILTERS—General Engineering Co., size 4 x 4′, arranged for belt drive but including vacuum equipment.

CHICAGO-PNEUMATIC NO. 117 SHEETING DRIVER.

WIRE ROPE—12,000 ft. 1″ 6 x 19 Plow Steel Hemp Center Non-PreFormed Cable.

12,000 ft. 1⅛″ same as above.

—IMMEDIATE SHIPMENT—

WRITE OR WIRE

CENTRAL EUREKA MINING CO.

Russ Building — San Francisco, Calif.

Smelting on Site

with

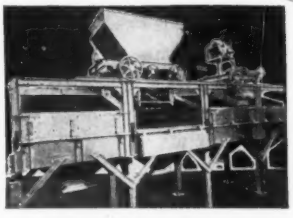
MACE Furnaces

and

Sintering Hearths

Saves high transportation and treatment charges on your ores and concentrates.

Wire or write for new catalog.

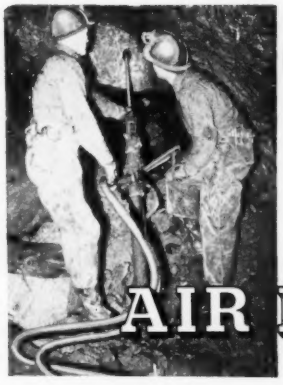


Standard sizes 5 to 250 tons capacity. Working scale tests on ton lots or larger made at our Denver smelter. Send us an analysis for preliminary report.

The Mace Company

FIRE CONCENTRATION METALLURGISTS

2763 BLAKE STREET, DENVER 5, COLO., U. S. A.



GOODALL "MINE-KING" AIR HOSE

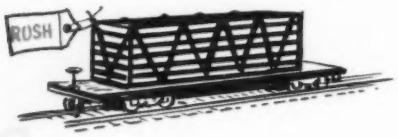
Keep pneumatic equipment working at full capacity with MINE-KING Air Hose. Extra thick pliant rubber cover resists severest abrasive action. A brown oil-proof tube, encased in high quality braided framework, gives MINE-KING the fortitude to withstand gouging, and prevent hose wall separation due to oil and moisture. Assure a steady flow of air with extra durable MINE-KING Hose.

Other Goodall Products: Conveyor belts, Rubber footwear, Waterproof clothing, all types of hose.

GOODALL RUBBER CO.

LOS ANGELES • SEATTLE • SALT LAKE CITY • SAN FRANCISCO

WHAT'S A Delivery Promise THESE DAYS?



A promise is still a promise, and Colorado Iron Works is proud to be known as a promise keeper. There's a rule of long standing at Colorado Iron that no delivery is to be missed—ever.

Here is a recent example of the appreciation prompt deliveries receive:

"The management has asked me to write you and express our appreciation at receiving this machine right on schedule. We realize how difficult it is to meet delivery promises these days, and you and your organization are to be congratulated on the manner in which our order was handled. It has helped us a great deal at this end, and will enable us to have the densifier in place with all connections made several days ahead of the anticipated date."

This is a paragraph quoted in its entirety from a letter dated Sept. 30, 1948, from the American Zinc Company of Tennessee after receipt of a 48" Akins densifier from Colorado Iron Works Company.

Quality must be maintained with delivery. Colorado Iron engineers have consistently turned out products which are capable of giving better results than were originally specified, say the operators.

Ask for the figures that prove these statements—we have them! For top performance and on-time delivery, permit our engineers to consult on your milling problems and plans.

A battery of five Akins classifiers in use at the Noralyn mine of International Minerals and Chemical Corp.

COLORADO IRON WORKS COMPANY

MAIN OFFICE & WORKS, DENVER 2, COLO., U.S.A.

Canadian Locomotive Co., Ltd., Kingston, Ont., Can.; Head, Wrightson & Co., Ltd.; Stockton on Tees, Eng.; John Carruthers & Co. (Pty.) Ltd., Sydney, Aus.; Vancouver Iron Works, Ltd., Vancouver, B. C., Can.; Head, Wrightson & Co., S. A. (Pty.) Ltd., Johannesburg; Edw. J. Nell Co., Manila, P. I.

BULGARIA — Lead output in the first quarter of 1949 and steel output have risen 56 and 50 percent, respectively, over the production goal set at the beginning of the year, according to the Minister of Mines at Sofia. The lead-zinc mines of *Madan* and *Momchilovgrad* in the Rhodope Mountains have shown the sharpest increase following the discovery of new orebodies recently. The pyrite deposits of *Eleshita*, containing about 50 percent sulphur, are being developed and plans are underway to build a plant for the manufacture of sulphuric acid rather than to export the ore as has been done so far.

NORTH AMERICA

BRITISH COLUMBIA—Construction of a small mill to handle ores from the *Highland Bell, Ltd.*, property at Beaverdell is being considered by directors. President Karl Springer says that discovery of silver ore below shipping grade but sufficiently rich for a good grade of mill feed has made construction of a mill feasible. A winze will be sunk this year at the point of discovery and a new low level No. 10 established on the property.

MANITOBA — *Sannorm Mines*, Ltd., has installed a drilling rig at its Rice Lake property and has completed its first hole. Plans are to continue surface drilling on a possible orebody 600′ long and 1,100′ deep. Also the company will sink a 560′ shaft with two levels at 275′ and 525′.

IDAHO—J. E. Berg, general manager of the *Federal Mining and Smelting Company*, reports that the company's *Page* mine between Kellogg and the Pine Creek district, is now producing 500 tons of lead-silver-zinc ore daily. Significant is the fact that the Page, a comparatively new mine, was once considered a white elephant. Because of a labor shortage and increasing depth, production at the company's *Morning* mine is now less than that of the Page.

ALASKA — The *U. S. Smelting Refining and Mining Company*, which started operations in March with three dredges, reports that five dredges will be operating throughout the summer season.

BRITISH COLUMBIA—Dr. Frank C. Buckland, consulting engineer, has optioned the *Emerald-Glacier* lead-zinc mine on Tahtsa Lake, 80 miles south of Houston, and is proceeding with a program designed to place the mine on production with a mill of probably 150-ton daily capacity. Work done between 1928 and 1931 is said to have developed between 100,000 and 150,000 tons of ore, averaging 15 percent combined lead and zinc.

ONTARIO — A diamond drilling program conducted during the past few months at the *Trebor Mines* copper-nickel property in the Temagaini section has resulted in tremendously increased estimates of ore reserves. For an overall figure, Managing Director Walter A. Rukeyser estimated 1,500,000 tons down to the 150′ level and several times that amount below 150′. Tonnage estimates represent about one-half the total length of one mineralized zone explored to date. Bulk samples are now being taken for mill testing.

QUEBEC — Continued improvement in grade, tonnage and efficiency is reported by *East Sullivan Mines, Ltd.* at its property near Val d'Or. The grade is said to have increased to 1.93 percent copper, and with the 2,000-ton concentrator operating at capacity, costs have dropped to less than $3 a ton. The zinc content in the ore has also increased so that it was possible to start operating the zinc recovery unit, and regular shipments of zinc concentrates have begun.

ONTARIO—*Renabie Mines, Ltd.*, operating at Missanaibi in the Sudbury mining division, reports a comfortable profit from its 400-ton daily mill rate which may gradually be increased by 25 or 50 tons. The No. 2 shaft has now been completed to a depth of 960′ and the first or 525′ level developed by a 270′ crosscut to the "D" orebody.

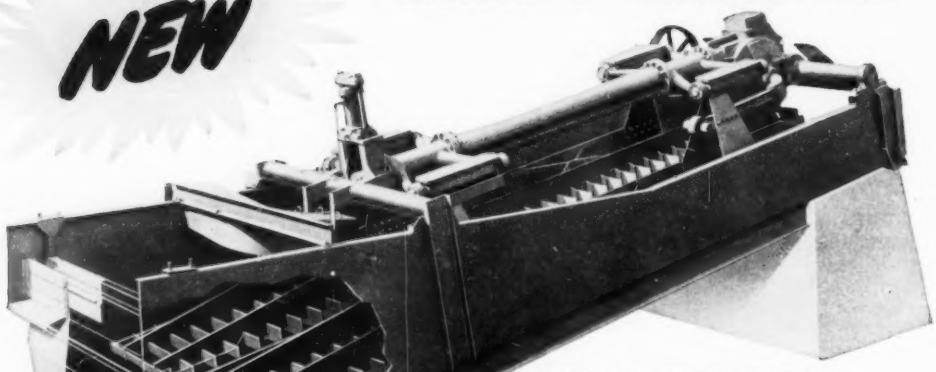
JOHN G. REILLY, at one time managing director of the Cia. de Real del Monte y Pachuca at Pachuca, Hidalgo, Mexico, and until recently general manager of the Bayard, New Mexico, department of the United States Smelting Refining and Mining Company, has resigned to set up his own consulting business.

QUEBEC—An option on 14 claims in Montbray Township has been taken by *Bouzan Gold Mines, Ltd.*, which reports exploration has disclosed sulphide occurrences carrying copper and nickel values. The company recently discontinued diamond drilling on the *Hastings* lead property after 5,000′ failed to disclose satisfactory results.

DFC
METALLURGICAL CLAY GOODS
For dependable assaying you must use dependable clay goods.
DFC CRUCIBLES
DFC MUFFLES
DFC ANNEALING CUPS
DFC CUPELS
DFC ROASTING DISHES
DFC SCORIFIERS AND TRAYS
Every piece made to perform its job efficiently. DFC on the product—means satisfaction on the job. Be certain — Demand DFC.
The DENVER FIRE CLAY Company
EL PASO, TEXAS
NEW YORK, N.Y.
DFC
SALT LAKE CITY, UTAH
DENVER, COLO., U.S.A.

NEW

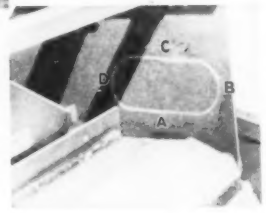
a major advance in the mechanical refinement of classification units



THE DORR HX CLASSIFIER—DUPLEX MODEL

...the Dorr TYPE H Classifier

◀ Chalk marking the rake path of a duplex Dorr HX Classifier in shop demonstration.



Type H Classifier rake path ▶ chalked on side of tank. Note flat raking and return strokes (A and C) and eliptical raising and lowering strokes (B and D). Regular pattern of rake path shows how rakes are synchronized both horizontally and vertically and balanced at all times.

Incorporating an entirely new and radically different headmotion design and rake path, the new Dorr Type H Classifier line represents a major step forward in the mechanical refinement of classification units. It offers many definite advantages over its predecessor, the Type F . . . yet retains all the features which have made the Dorr Classifier an accepted standard throughout the world.

Simplicity is the keynote of Type H design. It has few moving parts and the simplest Classifier lubrication system yet devised. It employs a fully harmonic raking motion and a long, full-load raking stroke. It is equipped with a hydraulic lift mechanism that provides more than 12 inches of rake lift in the pool. It is designed for *work* . . . for high efficiencies and low operating cost.

Bulletin #2281 gives complete information on this radically different unit. Write for your copy now . . . or better still, have a Dorr engineer show you what the superiority of Type H design means in terms of your own operation. No obligation, of course.

DORRCO

THE DORR COMPANY, ENGINEERS
570 LEXINGTON AVE., NEW YORK 22, N. Y.
ATLANTA • TORONTO • CHICAGO
DENVER • LOS ANGELES
RESEARCH AND TESTING LABORATORIES
WESTPORT, CONN.
SUGAR PROCESSING
PETREE & DORR DIVISION, NEW YORK 22, N. Y.
ASSOCIATES AND REPRESENTATIVES
Dorr Technical Services and Equipment Are Also Available Through Associated Companies and Representatives in the Principal Cities of the World. Names and Addresses on Request.

DORR

RESEARCH ENGINEERING EQUIPMENT

Civil Service and Servants

The excellent report of the Hoover Commission has been made public. It deals largely with the economies that may be gained by a reorganization of the Executive Departments of the Government. Economy in the cost of government is greatly to be desired, but there is a co-ordinate desirability in the kind and character of the services that are rendered at such great cost. The attitude of the officials toward their duties and the public is of paramount importance.

Some years ago a friend was elected to the position of county attorney in an important county of the Southwest. When asked what he considered his first important duty, he said, "I consider it is my first duty to teach some of these officers that when we give them a badge and a gun it is not a license to shoot a man where his suspenders cross." That is, of course, an extreme case, but the attorney's complaint touches an attitude by many officials that is too common. The mining industry has been the target, all too often, of punitive, official police action, when we had the right to expect consideration and assistance.

Those of us who have had to work abroad have been long accustomed to the top-lofty attitude of State Department officials. The Army "pulls rank," while the State Department "pulls protocol." It is hard to say which is the more hidebound. We well remember our consular representative in an important Mexican city, who was in office there for twenty-one years and never learned to speak Spanish. When troublous times came so that it was necessary to contact an American consul we were apt to be told, "Well, what do you expect? You do not have any right to be down here anyway." On the contrary, an appeal to a Britisher always brought good advice, and help where possible. Why such a difference? By precept and training the Britisher in Civil Service was never allowed to forget that he was a CIVIL SERVANT, no matter how high his office. Of late years our State Department has begun to work a change, but we still have a long way to go.

It has been interesting to read the Congressional Record, and to study the subtle methods used by Departments and Bureaus in grabbing for more power, as shown by the Committee hearings. The Civil Service Commission has not been backward in that direction. As of June 30, 1948, this Commission carried 1,859,807 names on its rolls, employed by the Government in the United States. This was an increase of 325 percent in eighteen years. According to the Record, the Commission has been very active in classification, tenure of employment, and seniority, BUT, nowhere have we found that there was any effective training to make its people realize that Service to the public was the primary duty of all on the Civil List. It is John Citizen that pays the salaries. He has the right to demand—Courtesy - Cooperation - Service.

Many years ago it was written: "Whosoever will be great among you, shall be your minister; and whosoever of you will be chiefest, shall be the servant of all."

If this rule were followed there would be more prospects developed into producing mines. There would be less need to say that the United States has become a "Have Not" nation.

The Wanderer

QUICK SHIPMENT

COLUMBIAN BOLTED STEEL MINING EQUIPMENT

AGITATORS • THICKENERS • SOLUTION TANKS • ORE BINS, ETC.

No costly delays. Your order is handled in record time by an expert staff of engineers and designers. Then it is fabricated in one of the best equipped manufacturing plants in the Mid West, with modern presses especially designed for the purpose.
Lower your costs with Columbian Mining Equipment for permanent installation, yet portable if change in location is necessary. Standard construction for domestic use or for export by ocean freight. Special if for export via mule-back or airplane to final destination. Order from distributors listed below—or write direct for complete facts.

COLUMBIAN STEEL TANK CO. • Kansas City, Mo.

Distributors in the United States

Denver Equipment Company
1400 Seventeenth Street, Denver, Colorado

Eimco Corporation
54 South 4th West Street, Salt Lake City, Utah

Western Machinery Company
760 Folsom Street, San Francisco, California

Distributors—Foreign

Western Machinery Co., S. A.
Apartado Postal 215

Avenida Ejercito Nacional 458-D
Colonia Chapultepec Morales
Mexico, D. F.

SODA TRONA ASH

FREE FLOWING
HIGH ALKALINITY
UNIFORM

AMERICAN POTASH & CHEMICAL CORPORATION

3030 W. Sixth Street Los Angeles 54, California

Colorado Firm to Build Mill at Gold King Mine

The newly organized Cripple Creek Mining and Milling Company has let a contract to the Hack Engineering Company of Denver for construction of a new gold ore reduction plant in Poverty Gulch, just above the Gold King mine.

To cost approximately $200 thousand, the mill will have a capacity of 100 to 200 tons per day depending upon the amount of ore contracted for. Negotiations already have been completed whereby the Markley Mining and Milling Company will provide ore from its Mollie Kathleen and Tenderfoot properties.

Construction of the new plant will be completed four months after work begins, according to company director Sam Bailey of Lovelock, Nevada. At the present time, metallurgists are studying the ores to be treated after which the type mill will be decided and work started.

Vick Porter of Cripple Creek will be in charge of the company's operations, including development work on the Gold King which has just begun. Present plans call for extension of the 1,000' Gold King shaft and drifting on the vein which is the original Bob Womack discovery in the Cripple Creek district. Some 100,000 tons of mill grade ore is said to be broken in the Gold King stopes alone.

Andy Davidson, formerly mill superintendent of the Standard Cyaniding Company of Lovelock, will act as mill superintendent at the new plant.

Colorado School of Mines To Celebrate 75 Years

Discussion of vital problems by outstanding authorities in every phase of the mineral industry is scheduled in the tentative program of the seventy-fifth anniversary of the Colorado School of Mines September 29 and 30 and October 1 at Golden. The announcement was made by Harry M. Crain, chairman of the executive committee for the celebration.

Conferences on the general theme, "Mineral Resources in World Affairs," are scheduled for three sessions and will comprise discussions on the broad field of mineral industry economics. As tentatively announced, the programs of some of the conferences will include the following: Mining geology, metal mining, metallurgy, geophysics and industrial minerals. These divisions are of prime interest to mining engineers, metallurgists and mining geologists. Other sessions will be devoted to petroleum and coal mining subjects as follows: Petroleum geology and engineering geology, petroleum production and petroleum refining and coal mining.

COLORADO SCHOOL HONORS ALUMNI

Distinguished achievement medals were awarded to twelve alumni of the Colorado School of Mines for outstanding accomplishment in the fields of mineral engineering. The recipients (left to right) were James Ashley Clark, Otto Herres, Carl E. Lesher (standing), Blair Burwell (standing), Dr. James Boyd, Andrew Weiss, Dr. Edmond C. van Diest, Russell B. Paul, John F. Myers, H. C. Price and General Dale D. Hinman. The men were further honored by a luncheon at the Denver Club at Denver and at the annual commencement luncheon given by Ben H. Parker, president of the school.

COLORADO

Early resumption of operations is scheduled by *Gold Hill Mines, Inc.*, at its gold mining property, adjoining Minnesota Mines at Empire, Colorado, in Clear Creek County. The company has secured the services of Warren Prosser, Denver mining engineer, to make a report on the property after which a compressor, mucking machine, etc., will be installed. Comprising 16 claims, the property is developed by a 3,300' tunnel.

While preliminary work progresses smoothly on the new Carlton mill at Elkton, Colorado, considerable headway is being made on dismantling the old *Golden Cycle* mill at Colorado Springs. At latest report, mill employees were tearing out the roasters and flotation plant, and dismantling of the buildings was expected to begin shortly. It is expected that the entire program will be completed early this fall. Virtually all of the 100 mill employees will be kept on the job during this period.

W. O. Erickson, operator of the *Foursome* properties near Animas Forks, San Juan County, Colorado, reports that he has several thousand tons of ore ready for shipment at the mine.

Operations have been discontinued temporarily by *Gold Empire, Inc.*, at the *Mary Nevin* mine, Cripple Creek, Colorado, pending completion of arrangements for new financing. Before suspension of work, driving of the Rosebud tunnel and a raise to the surface were completed. Renewed operations will include opening of the Mary Nevin shaft and work on the lower levels of the mine where orebodies are known to exist. Mill machinery may also be installed in the Rosebud mill later this year to handle mill grade material previously developed in the Mary Nevin, *Hibernia*, and *Fountain Valley* claims.

A $15,000 new tailings filter is being built by the *Callahan Zinc-Lead Company*, Whitepine, Colorado, to

International Smelting and Refining Co.

ANACONDA
from mine to consumer

Buyers of

Gold, Silver, Copper, Lead, Zinc Ores and Concentrates

•

ORE PURCHASING DEPARTMENTS
MIAMI, ARIZONA
818 Kearns Bldg.
SALT LAKE CITY, UTAH

•

Copper Smelter
MIAMI, ARIZONA

Lead and Copper Smelter
TOOELE, UTAH

AMERICAN ZINC, LEAD AND SMELTING COMPANY

Buyers of Zinc Concentrates Suitable for Smelting in Retort and Electrolytic Smelting Plants, also Buyers of High Grade Lead Concentrates.

Address Communications to Ore Buying Department

Paul Brown Building
ST. LOUIS, MISSOURI

927 Old National Bank Building
DUMAS, TEXAS
SPOKANE, WASHINGTON

Bunker Hill Smelter

Owned and Operated by

Bunker Hill & Sullivan Mining & Concentrating Company

Location: KELLOGG, IDAHO
(R. R. Station: Bradley, Idaho)

Purchasers of GOLD, SILVER and LEAD Ores. Producers of "Bunker Hill" Brand of Refined Pig Lead, Refined Gold, Refined Silver, Antimony Metal, Antimonial Lead, and Cadmium Metal.

For information regarding Ore Rates, Address

BUNKER HILL SMELTER
KELLOGG, IDAHO
CONSIGN ALL SHIPMENTS to BRADLEY, IDAHO

MAGMA COPPER COMPANY

Buyers of

COPPER, GOLD
AND SILVER ORES

MINES AND SMELTER AT
SUPERIOR, ARIZONA

BREAKING GROUND FOR COLORADO MILL

The picture above shows the progress to date on the construction of the new Carleton mill of the Golden Cycle Corporation at Cripple Creek, Colorado. On the drawing boards is a plan for an "L" shaped structure, 414' wide and 463' long which will be built on six levels. The photograph shows a number of the terraces already cut to provide for the new mill. Work of a preliminary nature is well ahead of schedule, according to A. H. Bebee, general manager, and concrete is being poured regularly. Supplies are kept rolling by a 20-ton semi-trailer truck that operates between Cripple Creek and Colorado Springs.

replace its present pond filtering system, now requiring extensive cleaning. According to J. E. Dunn, superintendent, the company has spent $25,000 so far on tailings disposal in its efforts to prevent stream pollution.

The *Highland Mary Mines, Inc.*, at Silverton, Colorado, has resumed operations of both mine and mill. One of the oldest lead-gold-silver mines in the district, it operates about eight months of the year and employs from 30 to 40 men.

At Masonville near Fort Collins, Colorado, the discovery of a 10 ton crystal of beryllium has been reported by a prospector who found it at surface on Crystal Mountain. It has been sold for $2,500. The largest beryl crystal found in the United States weighed 60 tons and was discovered in South Dakota's Ingersoll mine.

Possibility of a strike of gold-silver ore in a section of the *New Monarch Mining Company's Little Winnie* property near Leadville, Colorado, has been reported. According to Charles Hopkins, one of the operators of the mine, during drifting operations in a strand of the Winnie-Luema fissure vein system the ore was discovered. Development work is continuing to determine the value of the find.

A contract for a minimum of 100,000' of diamond core drilling in Colorado and Utah for possible uranium deposits has been awarded to Hybarger & Son, Bayfield, Colorado, by the Atomic Energy Commission at Grand Junction. The amount of the contract is $186,698.

United States Vanadium Corporation's Rifle Creek mine at Rifle, Colorado, has hit 100 tons per day production since reopening, and the Naturita, Colorado, mines are producing a steady 120 to 130 tons per day of carnotite and vanadium ores. In the latter properties ore is being processed at 100 tons a day with the remainder stockpiled. Several new mines are being opened up and older ones being prospected. New equipment has been delivered sufficient to permit full operation of the shallow mines in the area.

Frank Zaitz Mining & Reduction Company, Leadville, Colorado, has ceased shipping its oxide carbonate lead ores from its *St. Louis Tunnel* because of the current price drops. However, the company has developed new stopes off the main tunnel level, and the station at the Palmer winze was re-timbered in preparation for future needs.

SOUTH DAKOTA

The *Peerless* mine at Keystone, South Dakota, has produced so far over 500 tons of beryl ore of good

NEW! **Only 54.50**

Pocket-Size Geiger Counter for Uranium Prospecting

Now you can carry a highly sensitive and dependable Geiger Counter with you on every field trip. Don't miss a chance at the big Government rewards. The NUCLEAR "SNIFFER" weighs only two pounds, and uses only two ordinary Flashlight Batteries for power. No expensive replacement problems. The "SNIFFER" will detect any gamma radiation reaching it, no matter how deep the source. Provided complete with Earphones and leather handle . . . Only $54.50

W. D. BRILL COMPANY

198 TENTH STREET OAKLAND 7, CALIF.

value on its property, once worked with less success for scrap mica. Three men in a six week period produced 15 tons of ore valued at about $250 per ton.

UTAH

At latest report, the *Kennecott Copper Corporation* was pouring concrete for the tanks at its new $16 million copper refinery near Garfield, Utah. The plant, which will employ 800 men, is scheduled to start production in the middle of next year. In connection with the refinery, Kennecott and *AS&R* are jointly building a $3.5 million anode casting plant to convert the blister cakes into anodes. All buildings should be roofed by fall so that equipment can be installed during the winter.

Park Utah Consolidated Mines Company, Park City, Utah, has stepped up ore shipments. Meanwhile, the new orebody on the 1,500 and 1,600 levels in the East Ontario Extension is reported to be responding favorably to development.

A new pump has been installed in the *Cardiff* mine in Big Cottonwood Canyon near Salt Lake City, Utah, to reduce the water level, following discovery of a new vein by lessee Lee Hicks. According to L. E. Stein, president of the *Cardiff Mining and Milling Company*, the mine had been inundated for many years causing solution of the limestone and a slow weakening of the overthrust which fell away to reveal the ore. It assays its greatest percentage in lead. Seven men hold leases on the property and 21 men are employed at the mine.

A new surface vein has been exposed by washouts at the *Cardiff Mining and Milling Company's* lead mine in Big Cottonwood canyon near Salt Lake City, Utah. L. E. Stein, mining investor, said the ore shows good value.

Metal Producers' Horn Silver mine and mill at Milford, Utah, is now working three shifts daily and is putting out a greater tonnage of recently mined ore and stope-fill. New equipment and renovation of the mill were necessary for the increased production.

American Smelting and Refining Company at Salt Lake City, Utah, announced a cut of the work week at its *Garfield* copper smelter and Murray lead smelter to 40 hours. The change affects 900 men at the Garfield smelter and 300 at Murray. The Garfield smelter, however, will continue to operate seven days a week. Extra men will be hired for the additional operating time.

Why Use Old-Fashioned Methods . . . when . . .

MANGANAL

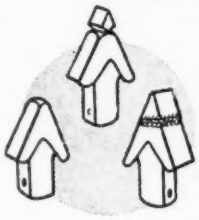
Trade Mark Reg. U. S. Patent Office
11% to 13½% Manganese-Nickel Steel

WEDGE BARS

put your worn equipment back to work . . .

FASTER . . . MORE ECONOMICALLY

Back in the old days worn bucket teeth had to be built-up with electrodes to the shape desired. Now, MANGANAL 11% to 13½% Manganese Steel WEDGE BARS eliminate the need of building-up weld material. They cost less and usually outlast new teeth. MANGANAL workhardens to 550 Brinell. Thrives under severe impact and abrasion. Tensile strength is high — up to 150,000 p.s.i. Available in 22 sizes to fit any tooth size. MANGANAL is the short-cut to true economy.



Wedge Bar attached to worn down Shovel & Dipper Teeth

PRACTICAL APPLICATIONS:

- Dipper Teeth
- Bucket Lips
- Side Cutters
- Dredge Cutter Heads
- Filler Metal for Manganese R.R. Trackwork

FREE: Send for copy of latest "Manganal Marketer."

STULZ-SICKLES CO.
SOLE PRODUCERS
91 N. J. Railroad Ave. Newark 5, N. J.

NAME OF NEAREST DISTRIBUTOR ON REQUEST

SuperDuty
DIAGONAL DECK
No. 6
CONCENTRATOR TABLE

DEISTER DIAGONAL DECK OVERSTROM

SuperDuty TABLES BLAST
OLD IDEAS WITH MODERN PERFORMANCE

Engineers who have clung to old ideas about table performance are now swinging enthusiastically to SuperDuty Diagonal Deck Concentrating Tables. These amazing tables are producing higher grade concentrates at costs quite in keeping with modern standards of efficiency. Today's SuperDuty tables explode all recollections of *old model* design and performance. Insist on knowing *all* the facts about SuperDuty Tables. Send for Bulletin 118A.

THE DEISTER CONCENTRATOR CO.
The Original Deister Co., Incorporated 1906
925 Glasgow Ave. Ft. Wayne, Ind., U. S. A.

COUNTY MAPS

For Schools, Hunters, Fishermen, Public Offices, and Travelers

CALIF.: with Twnshp., Rng., Sec., Mines, Roads, Trails, Streams, Lakes, R. R., Schools, Rngr. Sta., Elev., Ntl. Forest, Pwr. Lines, Canals, Boundaries, etc.

Sizes: 20 x 30 to 73 x 100 inches

Alameda, Alpine, Amador, Butte, Calaveras, Colusa, Contra Costa, Del Norte, El Dorado, Glenn, Kings, Lake, Marin, Mariposa, Merced, Napa, Nevada, Orange, Sacramento, San Benito, San Francisco, San Joaquin, San Mateo, Santa Clara, Santa Cruz, Sierra, Solano, Sonoma, Stanislaus, Sutter, Ventura, Yolo, Yuba—each $1.

Tuolumne, Santa Barbara, Plumas, Placer, Modoc, Madera—$1.50.

Tulare, Tehama, Imperial—each $2.

San Diego, Mendocino, Humboldt—$2.50.

Trinity, Shasta, Mono, San Luis Obispo, Monterey, Lassen—$3.

Fresno, Kern, Riverside—$2.50 - $5.

Los Angeles—$1 and $3.

Siskiyou—$2 and $4.

Inyo County, $15; E or W½, $7.50; San Bernardino, 73 x 110, $15; No. or So. ½, $7.50; NW., SW., NE., or SE. ¼, $3.75.

Also Oregon, Idaho and Washington County Maps.

WORLD'S MINERALS
2417 San Pablo Avenue
OAKLAND 12, California
TEmplebar 2-3870

precipitates—NORTHWEST

Sullivan Acquires Control Of Metaline Contact Mines

The Sullivan Mining Company of Wallace, Idaho, associated with The Day Mines, Inc., has acquired control of the Metaline Contact Mines in northeastern Washington. The Sullivan company now has equities in five Metaline operations, and this new transaction brings most of this international camp under unified control.

The Metaline Contact Mines has a large acreage of possible mineral ground on the west side of the river, adjoining the properties of the Pend Oreille and Metalline Mining & Leasing Co., and the property owned by the Metaline & Pine Creek Consolidated Mining Co., now under lease to the Sullivan Company.

New officers of the Metaline Contact Mines are Stanly A. Easton, president, and L. E. Hanly, vice-president.

Idaho Company Planning Extensive Development

The recently incorporated Union Silver - Lead Mines is planning an extensive development of 17 unpatented mining claims located in the Union mining district of Idaho's Shoshone County in the dry ore belt of this district.

G. E. Monroe, president, reported that some surface trenching has been done which resulted in the location of two well mineralized veins of substantial width. Bulldozer stripping and surface diamond drilling will be started and more extensive surface prospecting will be undertaken this spring to locate any additional veins and also obtain information that will aid in determining the best possible program of mine development.

Officers of the company are G. E. Monroe of Mullan, Idaho, president; David Sobol of Coeur d'Alene, vice-president, and Arthur Rieske, Wallace, secretary-treasurer.

Idaho Monazite Sand Mine Will Expand

Rare Earths, Inc., which has established headquarters at Grangeville, Idaho, is planning to expand its two-year-old operation by offering $300,000 worth of stock to the public. The potentialities of the property are estimated at $125,000,000. The company has blocked out 1 million tons of monazite sand and is selling the concentrate for $125 per ton at its McCall separation plant.

The plant turns out about 10 tons of monazite and 40 tons of garnet daily besides zircon, ilmenite, cinnabar, and gold. Two dredges are on the properties, a third is awaiting contracts, and a fourth is being moved onto the property.

The company's first shipment, which went out last November, amounted to 40 tons of the sand, 99.1 percent pure, and contained 3 to 4 percent thorium.

According to Albert M. Nash, president and manager of *Hope Silver-Lead Mines, Inc.*, Clark Fork, Idaho, milling operations have now been stepped up to about 80 to 100 tons of ore daily, with production coming from old abandoned stopes. The company hopes to complete its 700 level crosscut to the Elsie K. vein and get into production at the lower depth this year.

The mountains of the Coeur d'Alene mining district will be the subject of intensive investigation this summer when eager prospectors set out with their Geiger counters in search for the uranium-bearing minerals often found in areas containing lead and zinc deposits. One prospecting club already has been formed in Spokane, where 10 aluminum mill employees associated to become Co-operative Prospectors on weekends. If they are successful in staking a claim, they stand to gain a $10 thousand bonus offered by the AEC as well as an income from the ore which the government will purchase for $24 to $3,000 a ton, depending on its contained percentage of uranium oxide. The state bureau of mines will test free of charge samples of radioactive minerals, and those passing the initial test will be sent to the AEC which also maintains a free assay service for uranium-thorium samples.

The *East Lemhi Mining Company* was recently organized at Salmon, Idaho, to operate the old *Kimmel* and *Leadville* mines at Leadore on the upper Lemhi River. Named as incorporators were J. F. Arnold, L. E. Beeson and R. K. Magney, all of Spokane. The mines were opened by John L. Magney some 25 years ago.

Silver Star - Queen Mine, Inc., Hailey, Idaho, will use the 500′ deep Rockwell shaft lying on adjoining property at the end line of its land where a new head frame is being built. The shaft will provide 100′ additional depth below the Queen workings after it has been unwatered. Development work at the Silver Star in the past several months includes the extension of the two-compartment shaft to the 125′ point, drifting an additional 125′ on the Foot Wall vein, installation of a new sump pump and construction of a timber-framing shed. A 52 - h.p. electrical double-drum hoist is also new.

The *Silver Dollar Mining Company*, near Wallace, Idaho, producing mainly from the *Rotbart* area which, so far, has been stoped from the 3,100′ level to the 2,500′ level, plans to develop the 3,250′ level in 1949. Development in the company's *Chester* vein will be carried out by *Silver Summit Mining Company* through a 50-50 profit sharing contract recently made between Silver Dollar and both Silver Summit and *Silver Chieftain, Inc.*

Lookout Mountain Mining and Milling Company, Kellogg, Idaho, has announced the completion of its shaft station, rope raises and skip pockets nearly 2,000′ down on the No. 3 main working level. The station has been cut large enough to provide room for track switches, tramming chutes, the hoist and other development equipment so that no delays will be necessary when future production plans go into operation. A new 1,000′ vertical shaft is to be sunk which will have two and a half compartments. The shaft will run down the footwall side of the vein somewhat removed from the vein proper so the formation will be solid. Assessments were necessary to provide the company with sufficient funds to sink the shaft which company officials feel will open up paying lead deposits.

A rich silver strike was made by *Sunshine Mining Company*, Kellogg, Idaho, during development work on its 3,100′ level. The new orebody is about seven feet wide and shows several foot-wide streaks of high-grade ore. The drift, advanced 32′ so far, continues to show good values. Crosscutting to the vein from the 2,700′ level has also started and will take about 10 months to complete.

Assays from a 50′ shaft recently sunk on the *New Rainbow Mining Company's* property in the Coeur d'Alenes, Idaho, show 3 percent lead and some silver and zinc. With values so quickly found, George Austin, president of the company, plans to

go right ahead with an 800′ crosscut, which should be completed by November. The company owns 2,000 acres of land, has built a one-mile road to its property and is well equipped with a diesel engine, a Gardner-Denver compressor, a new mucking machine and other necessary machinery. Diamond drilling has gone on through the year, and bulldozing operations, which turned up a vein of highly oxidized iron capping with values in silver, lead and zinc a while ago, led to the above shaft sinking.

Offset shaft sinking has begun at *Day Mines, Inc., Tamarack* mine, Wallace, Idaho, where the company expects to go down 300′. The present offset shaft is 300′ deep and completion of the sinking will put the depth about 1,800′ below the working tunnel.

Take-over of the old *Cumberland* mine near White Sulphur Springs, Idaho, is planned by *Silverton Mines, Inc.*, Wallace. The mine was a large producer of lead - silver - gold ore many years ago.

Highland - Surpprise mine near Wallace, Idaho, has cut its crew to 60 men due to high metal costs. The company had been operating its mill on three shifts and is now going on two. Development work will continue, however, with plans to sink the shaft to the 1,400′ level from the 1,150′ level. Work will also continue on the 700′ and 1,150′ levels.

Lucky Friday Silver-Lead Mines Company, Kellogg, Idaho, is cutting a skip pocket on the 1,600′ level. A 210′ crosscut to the vein will be started next, with expectations of opening the orebody on the 1,600′ level about August 1. The mine is stockpiling around 40 tons of ore a day from stopes on the 1,400′ and 1,000′ levels. Treatment will be handled at the Golconda mill.

Silver Surprise, Inc., is now handling the old *Globe Silver* mine in the Coeur d'Alenes, Idaho. The property lies between *Metropolitan* and *Sunshine Consolidated* claims in the silver belt.

A new company has been formed under the name of *Bagdad Mining Company* at Wallace, Idaho. Capital is $100,000, and incorporators are Norman M. Smith and Robert Hardy, Jr., of Kellogg and Alden Hull of Wallace.

Nabob Silver-Lead Company, Kellogg, Idaho, has resumed work in its deep development tunnel and is drifting about 400′ easterly to get under the orebody now being mined by lessees in the upper levels.

A new Idaho corporation, *Paint Products, Inc.*, has been organized by a group of Wallace residents, headed by Barney Wilcox, with the purpose of acquiring, mining, smelting, and refining titanium metal from ilmenite ores. The firm owns eight placer claims in Central Idaho, said to contain a large deposit of ilmenite sand. Ilmenite sands will be trucked to the company's Wallace laboratory for experimentation purposes.

The *Hypotheek Mining Company*, operating in French Gulch, west of Kellogg, Idaho, is currently making timber repairs in the drift, preparatory to starting stoping operations. This work follows the recent discovery of ore found in the caved ground being excavated from the west drift on the 700 level. The mine has been unwatered 50′ below the 700 level, and pumps are now draining the voids from the old 900-level stopes.

MONTANA

Development work is being carried out by a new company, *Kimball Mines, Inc.*, Elliston, Montana. Workings consist of two tunnels, the upper of which cuts the gold, silver, lead and zinc orebody 50′ from the opening and follows the mineralization to the face 375′ from the intersection. At an elevation 90′ below this crosscut another tunnel now extending 60′ is expected to cut the orebody shortly. Indications are that development will continue to be justified for some years. No hoisting or pumping problems will arise.

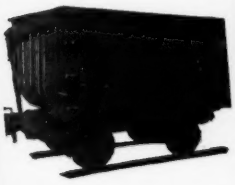
Carbonate Mines, Inc., Marysville, Montana, has drifted east 650′ from the Bald Butte 600′ level crosscut. This is parallel to a previously discovered gold vein and is pointed for a lead showing 1,500′ ahead. The showing was cut on the surface and showed good values in lead with some silver. The drift will be extended about 2,000′ to get below an old shaft which was sunk 12′ in 1931. A raise will be driven to connect with the shaft for ventilation. Crosscuts will be driven north and south after 600′ of drifting has been done. These are to intersect four other showings discovered on the surface a year ago.

Completion of *Anaconda Copper Mining Company's* $1,800,000 expansion program on its copper and zinc smelters at Great Falls, Montana, is expected in July, 1950. Plans include a plant to cast copper billets, a complete new unit in the zinc processing department and an employee's clubhouse.

Progress has been reported in the drifting operations of *Green Mountain Mining Company*, Dixon, Montana. The south drift, advancing at a rate of five feet per day, has reached 150′ with the objective a strong structure on the *Mayflower* claim about 100′ ahead. Some ore has been cut, though not of commercial

CARD CARS

A ♠ For "Lowest Cost per Ton Mile Haul"



A ♦ **In the final showdown, LOWEST COST PER TON MILE HAUL, is the stake you are playing for.**

Why not standardize on CARD CARS! From Cobalt to Sonora, practical mining men say "Every Card Car is an ACE in the hole."

A ♣ DESIGNED AND BUILT TO BEST MEET SPECIFIC CONDITIONS IN EACH MINE.

Ask for Catalog 40

A ♣

C.S. Card Iron Works Co.
Denver, Colorado

grade. Continued work is planned for the south drift besides resumption of operations to the north on the No. 3 level.

The core drilling operation at *Mitchell Mining Company's* property south of Virginia City, Montana, has proved three definite orebodies, the richest of which is a lead and silver vein below the main crosscut. Ore at the 22′ level of the three and a half foot vein was assaying high and a winze was started in advance of blocking out the vein. At 40′ silver mineralization was encountered and the footwall limestone shows lead and silver deposits.

The U. S. Grant Mining Company, Virginia City, Montana, has discovered a new orebody which may be a parallel vein in its *Easton - Pacific* mine. The ore was found in a crosscut in the No. 5 level of the old workings which had recently been connected by a raise to the new 4,600′ tunnel driven from Alder creek. The company mines highly siliceous gold-silver ore valuable for fluxing purposes and is preparing the Easton-Pacific mine for full-scale operation.

Two new Montana corporations are *Montana Shannon Mining Company* and *Cal Exploration Company*. The former has capital of $250,000 and the directors are D. L. Jones, Helena; I. P. Donovan, Helena, and W. C. Zimmerman, Portland, Oregon. The latter has capital of $100,000 and the officers are Rex R. Hydorn, Bess Hydorn and Darrell King of Billings.

Reduction of operations has been announced by the *Anaconda Copper Mining Company*, Butte, Montana. Work at the Belmont copper and Orphan Girl zinc mines is suspended. Filling and shaft sinking is temporarily suspended on the Greater Butte project. Miners are now on a five-day work week.

Mining operations have been resumed at *Commonwealth Lead Company's* silver-lead property in Melrose, Montana, according to Joseph F. Featherstone, manager. John B. Keene will continue leasing operations on another part of the property.

OREGON

The *Champion Extension* group of claims at Cottage Grove, Oregon, were leased last September to LeRoy Berrey and Martin Robinson, who have organized the *Day Basin Mining Company* and are preparing to install air equipment and other machinery. Shipments will be made from a body of lead ore which has been encountered. Day Basin offices are at Disston.

Uranium ore deposits may have been uncovered on the *Black Rock* mining properties in the Steen Mountains of Harney County, Oregon, according to Clifford T. Howlett, accountant and one of four men exploring the mines. Assaying revealed that the specimens found contained 4.27 percent uranium oxide.

The *Buffalo* gold mine at Granite, Oregon, with a crew of 10 to 12 men, has operated throughout the year and is reported by the Oregon State Department of Mines and Geology as the only lode gold mine and lead and silver producer active in Oregon in 1948. At present, a modern flotation mill is producing a gold, silver-lead concentrate that is shipped to the U. S. Smelting Company plant at Midvale, Utah.

Hi-Potential Mine, Cottage Grove, Oregon, is resuming work on its Vesuvius property, exploring an ore shoot on the Stocks-Harlow ledge where free - milling gold ores were worked some years ago. The company hopes to find values in the sulphide zone.

Bartels Mining Company, Cottage Grove, Oregon, is opening the road to its *Champion* mine property and preparing to put the 125-ton flotation mill into operation. The company makes a substantial recovery of gold and ships lead, zinc and copper concentrates to Tacoma for smelting. The plant has been closed down since last fall when early snows cut off supplies.

Brockton Nevada Mining Syndicate, Sumpter, Oregon, is about to start a second dredge on its gold placer operation, according to Local Manager Harry Ramsay. The company will also equip a nearby gold and lead quartz property, which has an 1,800′ tunnel showing good values.

WASHINGTON

Going into operation shortly is the big new compressor plant at *Pend Oreille Mines and Metal Company's* property at Metaline Falls, Washington. A 2,400 cfm. air compressor will deliver air to the mine workings through eight-inch churn drill holes. Concrete is being poured for a floor in an inclining shaft now 1,450′ deep or about one - half the proposed depth. Foundations for the shaft headhouse have been put in. From the headhouse a conveyor system capable of carrying 340 to 400 tons of ore per hour to the surface will provide feed for a 2,000 - 3,000 ton mill, now under construction. The turbine and generator for the second unit in the company's hydroelectric plant will be delivered in the early part of August. The installation of this equipment, as well as the required work at the intake, will be undertaken during the coming low-water period in the Pend Oreille River.

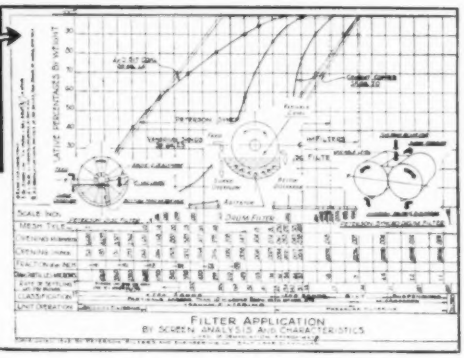
Discovery of a rich silver-gold-lead-copper vein six miles from Chewelah, Washington, is reported by E. J. Mullen and Clarence Culler. The vein is between Quartzite Mountain and Horse Shoe Lake, in rugged country, and was found when a ridge in the area was being bulldozed. The men, who own the *Galena Farm Mining Company*, Northport, have formed the *M. & C. Mining Company* to develop the new vein and have constructed a road to the property. The high-grade ore will be trucked out to Bunker Hill smelter at Kellogg and the remainder will be milled on the site. Further exploration is being carried on.

John R. Allen, president of *Manganese Products, Inc.*, of Seattle, reported recently that a war-born plant may be utilized to process army stockpiles. Built to produce aluminum from Pacific Northwest clays during the war, the $5.6 million plant is now operated by *Columbia Metals* in the production of ammonium sulphate fertilizer. This processing would continue along with the ferromanganese operations. The army is reported to have a large stockpile of ore at Las Vegas, Nevada; however, Manganese Products would eventually use its own ores from the Olympic peninsula, where its properties are situated.

Send for This
FILTER APPLICATION CHART

This chart has been prepared for easy handling in your Data Book. Every engineer should have one of these charts. Sent FREE without obligation.

Peterson
FILTERS & ENGINEERING CO.
MECHANICAL FILTRATION FOR PROCESS INDUSTRIES
137 MOTOR AVENUE SALT LAKE CITY, UTAH



precipitates—CENTRAL and EASTERN

Michigan's Biggest Ore Value Is Mather "A"

The Mather "A" property of Cleveland-Cliffs Iron Company, Ishpeming, has the highest recommended valuation of any iron ore property in Michigan, according to Michigan Tax Commission's appraiser, Frank G. Pardee. Last year the Mather "A" was evaluated at $3,000,000 and this year at $4,300,000, making the property of greater tax value than Oliver Iron Mining Company's Davis-Geneva, on the Gogebic range, which is placed at $4,110,000.

Total valuation for the four Michigan iron ore ranges is $48,649,000, with $24,488,000 of this amount credited to the Marquette range. Although heavy tonnage was shipped last year, reserves are estimated at 153,526,348 tons this year, approximately 3,000,000 tons more than in 1948.

Inter-State Operating New Heavy-Media Mobil-Mill

Operation of the new 100 T/H heavy-media separation plant of the Interstate Iron Company began the first week of June at the company's Grant mine near Buhl, Minnesota. With a Pioneer Engineering Works crushing plant preparing the material for beneficiation, the mobil-mill, which was installed by Western Knapp Engineering, will treat the Grant's iron ores.

Other beneficiating plants in the planning stage include a 625 T/H heavy-media separation plant to replace two sections of a now-operating 1,500 washing plant an a jig circuit to replace part of the washing plant at the Hill Annex mine.

A zinc strike has been reported by Jack Martin and A. G. Harreld on the *Wyman* ground in the Bonanza district, about a mile northwest of Galena, Kansas. Three test holes, sunk in a triangular area about 30′ apart, resulted in the discovery of the orebody which is said to continue from a depth of 14′ to 52′ so far. A number of additional test holes will be sunk to determine the scope of the deposit, after which strip mining will be started.

Chas. A. Neal, Miami, Oklahoma, head of the *Cardin Mining and Milling Company*, recently ordered production stoppages at the *Captain Tailing Mill*, Treece, Kansas; *Western Mill*, Cardin, and *Big Chief Mill*, near Cardin. The action resulted from the refusal of the union millers to accept a second wage reduction.

The Nellie B. Mining Company, whose field production is comparable to Eagle - Picher's, has instigated a five - day work week and reduced operations 70 percent, according to Manager J. H. Buchanan of Miami, Oklahoma.

Operations have been suspended indefinitely at the *St. Louis Smelting and Refining Company's Ballard* mine and mill at Baxter Springs, Kansas. Harold A. Kreuger, manager of the *Ballard* mine, said that 200 men would be affected by the shutdown which has been caused by recent economic trends.

Gallium has been discovered at Farmington, Iowa, by Isaac McCracken, who was excavating in his back yard when he came across the deposit. Assaying so far indicates workable values in gallium in the placer deposit.

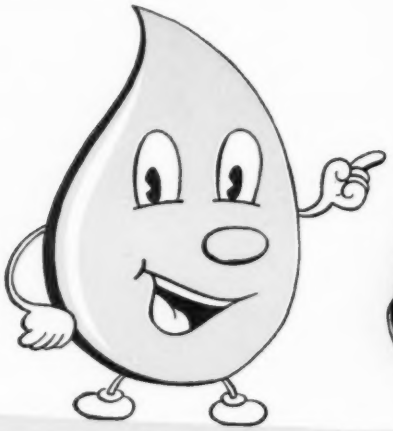
A shipment of 1,062,000 tons for the 1949 season is scheduled from *Inter-State Iron Company's Hill-Annex* mine at Calumet, Minnesota. The ore will be loaded five days a week with stripping of the south extension scheduled for one day a week. The No. 1 and 2 units at the washing plant will be taken out of service early in the fall, and, for the remainder of the season, washing will be continued with No. 3 unit only, the last unit installed and carrying one-third of the plant's load. A new jig plant will be installed for use in 1950 in place of one and two units. To the northeast of the old pit, a structure drilling program is planned to determine the extent of a lean ore showing.

(Continued on Page 68)

HEAVY-MEDIA FINDS APPLICATION ON MESABI RANGE

One of the Mesabi Iron Range's small plants recently placed in operation is this Mobil-Mill of the Pacific Isle Mining Company erected by Western-Knapp Engineering Company near Hibbing, Minnesota. Center and left in the picture are the truck receiving bin, crushing, screening and fine ore separation circuits. The primary crusher, rolls and most of the conveyors were manufactured by Pioneer Engineering Works of Minneapolis; fines are treated in Humphrey's Spirals. To the right are the heavy-media separation Mobil-Mill, tailings stacker and railroad ore receiving bin. Above are two of the fleet of fifteen, 20-ton, Cummins diesel powered Euclids used for ore haulage. At the base of the crushing plant is a Koering Dumpter which hauls large waste rock, scalped at the ore receiving pocket, to the dump. The mill, with 7′ separatory cone designed to treat 100 T/H of plus $\frac{3}{8}$″ iron ore, went into operation late last season. By installing an additional media washing screen and another Dings Crockett magnetic separator, this capacity was nearly doubled. The spiral circuit for treating minus $\frac{3}{8}$″ material was also installed within the past three months. Hugh Harrison is president of Pacific Isle, and John Boentje is superintendent of the concentrator.

This oil...



FOR ALL YOUR PASSENGER CARS AND LIGHT TRUCKS

...fights Acid Action of "On and Off" operation

THE MAJOR CAUSE OF ENGINE WEAR

Unique "X" Safety Factor in Shell X-100 Motor Oil Counteracts Acid Action

It's not friction, as generally believed, that causes the most engine wear.

It's Acid Action — chemical etching of engine parts that take place in the low engine temperatures of "On and Off" operation.

Intermittent use . . . long runs at idling speed . . . frequent stopping and starting — under such conditions, engines seldom warm up to efficient operating temperatures. They run "cold." Hence, combustion may be incomplete and partially burned fuel gases and moisture attack the smoothly polished metal surfaces *chemically*. It's this biting Acid Action that accounts for up to 90% of engine wear!

Shell Research worked all out on this problem . . . developed a unique "X" safety factor to combat Acid Action. Now, 2½ million miles of road testing and millions of miles of use by motorists have proved conclusively that with this "X" safety factor Acid Action is effectively counteracted — engine life is prolonged.

This triumph of Shell Research — another Shell "first" — comes to you only in Shell X-100 Motor Oil. This oil, famous for its ability to protect your engine under the stresses of sustained high speeds and extreme operating conditions, now gives you this added protection. It is unequalled by any other motor oil, no matter its price.

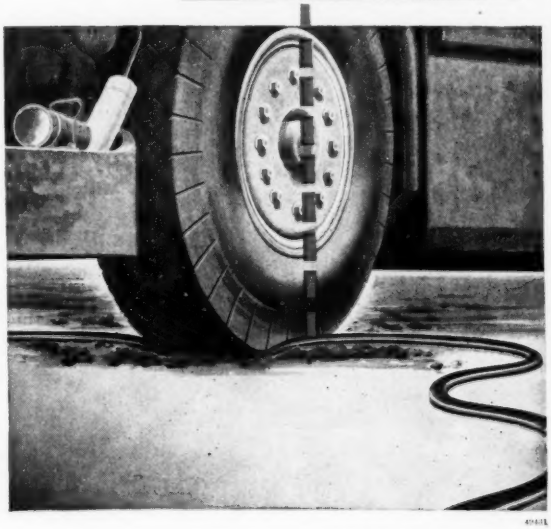
It's Incomparable!

...permits HEAVIER IMPACT

● Because of its patented Anti-Short Breaker Strip (available with or without ground wire) between conductors, Securityflex Parallel Mine Cable can withstand severe impacts with minimum danger of shorting. Adhesion between jacket and insulation —that makes a *solid block* around conductors—helps to give Securityflex its amazing crush-resistance. (Points that mean *greater safety* and *more tons per cable.*)

Other points of interest in Securityflex . . . neoprene jacket protects against flame, abrasion and tearing . . . engineered construction prevents kinking or twisting and stands up longer under extreme overloads . . . cable meets U. S. Bureau of Mines Flame Test and diameter specifications and Pennsylvania Flame Test.*

Specify Securityflex through your Anaconda distributor (all principal cities). Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.



*Insist on mark of *full compliance*—P-102-BM—at 1½' intervals on any mine cable you buy.

ANACONDA *Securityflex* **MINE CABLE**

ANACONDA
from mine to customer

(Continued from Page 65)

Stripping operations are to begin immediately on the long-dormant *Miller-Mohawk* mine property at Aurora, Minnesota, recently leased by the Youngstown Mines Corporation. The Mesaba Construction Company, Hibbing, has the contract for the work. A power line is being constructed to run between the Lake mine and the Miller-Mohawk.

Operations have been started by the *Charleson Iron Mining Company*, Hibbing, Minnesota, to treat 15 million tons of waste low-grade iron ore at the *Missabe Mountain Mine*. The company has suspended operations at the *Missabe Mountain* pit, and the conveyor belt has been moved to the new site, where a refinement plant has also been built to expedite operations. The waste pile is east of the *Minnewas Location* between Virginia and Gilbert, Minnesota.

North Range Mining Company has abandoned its attempt to reopen the old *Riverton* mine at Stambaugh, Michigan, after three months of pumping, shaft repairing down to water level and diamond drilling. Ralph S. Archibald, president of North Range, said that the orebody found at Riverton did not warrant continued operations. North Range now plans to begin pumping at the *Wa ner* mine property near Amasa.

Increased production to a possible 1,200,000 tons of iron ore is expected this year at the *Inter-State Iron Company's Columbia* mine at Virginia, Minnesota. A "friendly trespass" permit from the *Oliver Iron Mining Company* will allow Columbia to mine half of the above tonnage from Oliver's *Sauntry property* and thus maintain proper ore bank slopes.

Diamond drilling by *The M. A. Hanna Company* is continuing on the John Anderson and Stephen Matchatt farms near Highway M-69, east of Randville, Michigan. Ira Odgers of Crystal Falls is doing the drilling for the company.

Recent developments at *Inland Steel Company* include the acquiring of considerable acreage, well located in respect to the iron formation, on the Marquette and Menominee, and the removal of the district office from North Lake to Ishpeming, Michigan, in the former Oliver Iron Mining Company offices.

Pickands, Mather & Company have resumed operations at the Danube washing plant on the Mesabi iron range near Bovey, Minnesota.

Deepening of the *M. A. Hanna Company's Hiawatha* mine at Iron River, Michigan, Menominee iron range, has commenced with plans being made to sink 200′ in the No. 2 shaft, at present bottomed at 2,100′ deep. Primary crushing of the ore will be done underground, an operation similar to that at the nearby *Homer* and *Wauseca* mines, also operated by the Hanna Company. The Hiawatha mine has two shafts, the No. 1 and No. 2, which are connected on the 16th and 18th levels and will be the deepest in the district when the above mentioned work is completed.

Oliver Iron Mining Company's Eastern Division expects to start stripping operations on its Auburn mine on the Mesabi sometime during the current summer. The Auburn was first worked in 1894, but has been inactive since 1902. Trucks will be used in the early stages of stripping with a railroad being run into the property some time next year. It is expected that about 2,000,000 yards of overburden will be removed and ore production should begin in 1951.

Continued research on low grade iron bearing taconite is being carried on by the *Reserve Mining Company*, Beaver Bay, Minnesota, at its property at Babbitt on the eastern Mesabi iron range where the company anticipates it will begin operations when the necessary railroad and harbor facilities and a new power plant are completed.

ASK YOUR PIPE CLEANING HEADQUARTERS FIRST!

We can help you save money by keeping your pipe lines clean and tops in operating efficiency. We have all the tools, mobile equipment and experience necessary to do this work for you at costs so reasonable they will astound you.

Mine operators and others have learned to ask their FLEXIBLE PIPE CLEANING DIVISION FIRST before planning "boil-outs," costly "dig-ups" and replacements and other service interruptions. They also know that FLEXIBLE is equipped for emergencies, night or day, and will go anywhere.

Call or write George Ellis right now for a work estimate on your particular pipe cleaning problems. No obligation involved.

FLEXIBLE SEWER-ROD EQUIPMENT CO.
PIPE CLEANING DIVISION
(Los Angeles)
WRITE: P. O. Box 167 • Los Nietos, California
Phone: WH 4-4108

Use *FLEXIPIPE* . . . the quality ventilating tubing

FLEXIPIPE

Directs fresh air where you need it

The new improved Flexipipe is efficient, serviceable and economical. It's made in a variety of diameters and lengths and with various accessories to take care of your individual requirements. Write us for complete information and sample.

BEMIS BRO. BAG CO.
412 Poplar St., St. Louis 2, Mo.

FLEXIPIPE: Reg. U. S. Pat. Off.

FEEDOWEIGHT

A self-contained conveyor feeder scale that feeds, weighs, totalizes and registers. Use the Feedoweight for better control of ball mill grinding. It accurately controls FEED by WEIGHT, automatically. Made in sizes to meet all tonnage requirements.

MERRICK SCALE MFG. CO.
PASSAIC 172 Summer Street NEW JERSEY

precipitates—SOUTHWEST

Nevada Acquires a Big Manganese Plant

The recent acquisition from the War Assets Administration of the large holdings of the Manganese Ore Company in Clark County, Nevada, by the Nevada Colorado River Commission is of considerable note. Governor Vail Pittman said the purchase "not only provides manganese ore, which is in great demand, to the lessees at the Basic Magnesium, Inc., plant, but it will also make badly needed machinery available to the basic refractories redution plant at Gabbs."

The manganese ore concentrate, after reduction at the Gabbs mill, will be shipped to Cleveland for refining. Basic Refractories, Inc., will buy two huge Dorr thickeners to use in their mill for magnesite ore treatment.

Manganese Ore Company's property totals 63 mining claims, several of which are patented, and recent drilling operations have indicated that deposits amounting to many thousands of tons of manganese can be mined. Industrial activity in the area is expected to be greatly stepped up. Two large corporations are now investigating the properties in the thought of buying them from the Commission.

Nevada Plant Has Zinc Oxide Treatment Formula

Big news from Nevada is that treatment of 200 tons daily of zinc oxide ore at Basic Reduction Company, Henderson, may begin by midsummer. Using the facilities of Basic Magnesium's plant, the ore would be treated by a new process worked out after years of research by men from the United States Bureau of Mines at Henderson with the added assistance of the University of Nevada and Mackay School of Mines.

Reports have also been received that Combined Metals Reduction Company at Pioche, largest producer of zinc in Nevada, may build a plant to handle its zinc oxide ores.

For many years, working out an easy and inexpensive means of reducing zinc oxide has eluded chemists and metallurgists, and in Nevada thousands of tons have been left on dumps or sent to smelters, where sulphur values were extracted at penalty to the miner because of the incident of the zinc oxide.

The proposed operation would be of great economic importance to Nevada.

ARIZONA

The *Lucky Tiger Combination Gold Mining Company* has increased to 10 the number of men employed at its lease on the *Empire Arizona Mining Company's* property near Parker, Arizona. The vein is being developed on the 100′ and 200′ levels, and returns from two of the four carloads of copper - gold ore shipped so far indicate average values. If these values are maintained in additional development, stoping operations will be started and regular shipments made to the smelter. E. J. Stanley, Box 1677, Parker, is engineer in charge, and W. W. Harriett is superintendent.

An interesting copper strike has been made by Sidney Smith of Bouse, Arizona, during the sinking of a water well on his 160-acre tract of agricultural land. At a depth of 63′ the sands showed native copper, and at 75′ the drill was still in the same formation. Samples of the sand assayed from 20 to 25 percent native copper. The property is one mile north of Bouse on Highway 72.

The *Zannaropolis Mining Company* has resumed mining and milling operations at its tungsten claims near Congress, Arizona. Four men are employed under the direction of J. P. Zannaras, owner and manager, Box 500, Congress. The company's gravity-type mill has a daily capacity of 50 tons.

Officials of the *Inspiration Consolidated Copper Company*, Inspiration, Arizona, have announced that property is being reduced by apcopper production at the *Inspiration* proximately 20 percent below the recent monthly rate, resulting in a reduction of the working force by about 180 men. Unsettled conditions in the metal market and the current absence of copper demand, despite a marked drop in the sales price, were given as reasons for the production curtailment.

A 90-day option has been granted to Alexander M. McDonald of Salt Lake City on the Tombstone, Arizona, property of the *Tombstone Development Company*, a heavy producer of high-grade silver ore in the early days. According to A. P. Giacoma of Tombstone, who served as agent in the transaction, future plans hinge on the report which will be made by two geologists now surveying the area for McDonald.

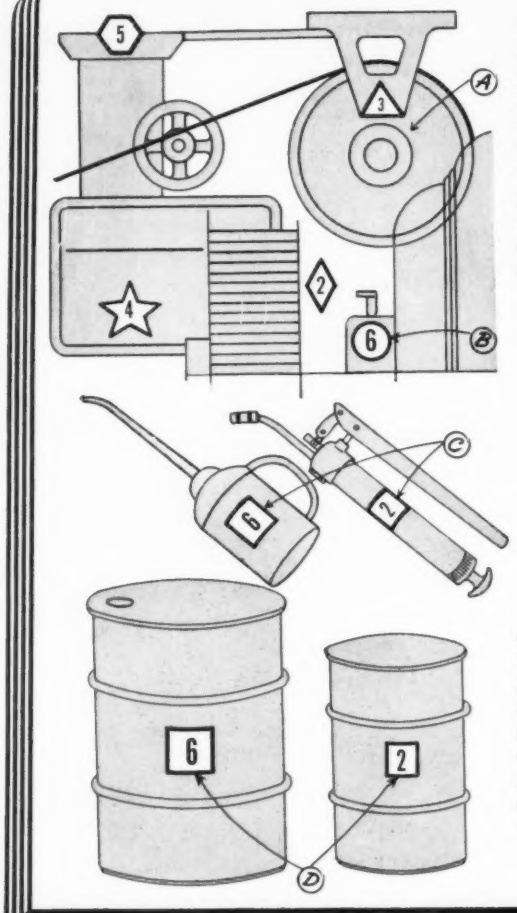
(Continued on Page 72)

CALIFORNIA'S NEW IRON MINE

Forty carloads of iron ore are moving daily to the Fontana Steel mill from the new Kaiser mine at Eagle Mountain, California, near Desert Center. This is a virtual doubling of shipments made during the early months of this year. By October, when the second blast furnace at Fontana is ready for operation, the iron ore tonnage from Eagle Mountain will be stepped up to approximately 70 cars daily. The last of the iron ore from the Vulcan mine near Kelso, California, was recently delivered to Fontana. Actual mining operations at Vulcan ended in July, 1948, and since that time the Kaiser blast furnace has been operating from ore stock-piled at Kelso supplemented by ore from Southern Utah.

STANDARD ENGINEER'S CASE FILE

Case 1102—Preventing Lubrication Mistakes in Plants & Motor Fleets



Many operators of plants and fleets in the West have practically eliminated operation delays due to improper lubrication or use of wrong lubricants, by installing Standard of California's free, coded system of planned lubrication. The system employs symbols instead of colors to indicate lubrication intervals -- stops mistakes caused by color-blindness, faded colors or changed appearance of color in different lights. Available for plants and fleets in the Seven Western States.

A. Black-on-white decalc symbols show desired lubrication intervals at a glance. Are placed directly on machine at lubrication points.

B. Numbers on the decalcs indicate the kind and grade lubricant to be used at each point. Chart card on each machine gives meanings of symbols and numbers.

C. Lubricant number-decalcs on dispensers identify lubricant in each dispenser and prevent its use in wrong place.

D. Lubricant number-decalcs on barrels, cans or other storage show kinds and grades of lubricant in stock.

All decalcs, chart cards and other material for the Standard Coded System of planned lubrication, and installation of the system are free. On request, a Standard Fuel and Lubricant Engineer from Standard Technical Service will survey your plant or other operation any place in the Seven Western States. He will make recommendations, give expert advice and install the Standard Coded System if you desire it.

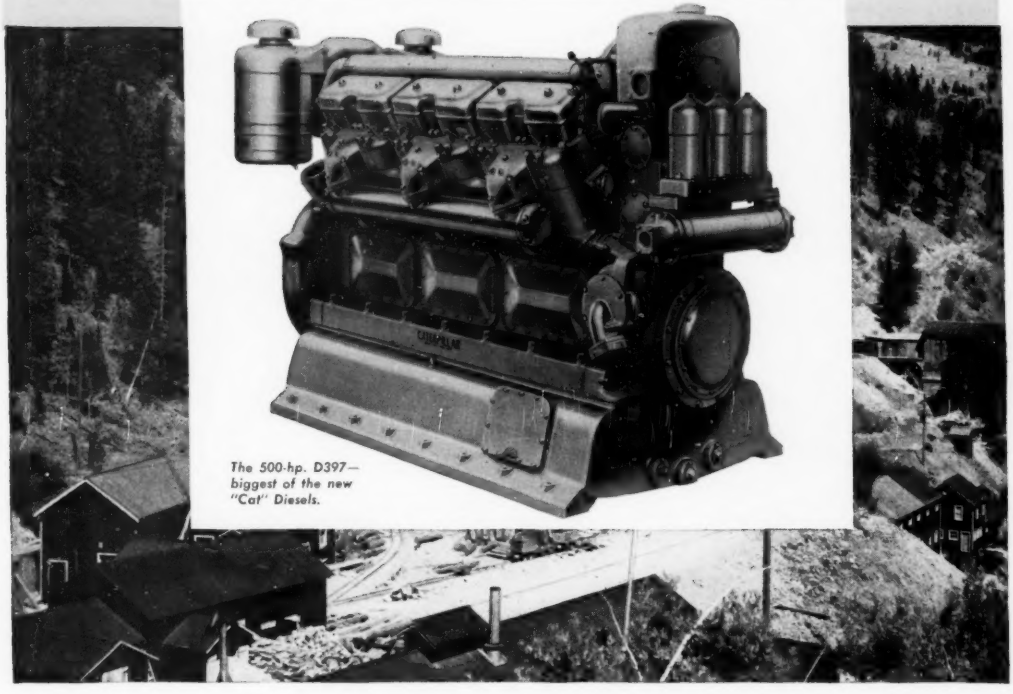
Trademark Reg. U. S. Pat. Office

STANDARD TECHNICAL SERVICE will make your maintenance job easier. If you have a lubrication or fuel problem, your Standard Fuel and Lubricant Engineer or Representative will gladly give you expert help; or write Standard of California, 225 Bush St., San Francisco 20, California.

CALOL

FOR EVERY NEED A **STANDARD OF CALIFORNIA** JOB-PROVED PRODUCT

New BIG YELLOW ENGINES BUILT TO HANDLE BIG JOBS



The 500-hp. D397—biggest of the new "Cat" Diesels.

MINING MEN the world over have learned from long experience that they can always depend on "those big yellow 'Caterpillar' Diesel Engines." They've proved themselves in shovels, dredges, draglines, compressors, hoisting machinery, and as Electric Sets.

Now you can power even bigger equipment—with new, bigger "Cat" Diesels. In addition to present models, four great new Engines, ranging up to 500 hp., and four new Electric Sets, generating up to 314 kw., are now coming out of the world's finest, most modern engine factory. Every one is designed to burn low-cost, non-premium fuels—assuring substantial savings. Every one is given a closely supervised dynamometer run to assure proper break-in and full horsepower output.

When you buy new equipment, specify "Caterpillar" Diesels for power. And when you consider replacing the power in your present equipment, call on your reliable "Caterpillar" dealer. For immediate information, SEND IN THE COUPON.

CATERPILLAR TRACTOR CO., San Leandro, Calif.; Peoria, Ill.

CATERPILLAR
REG. U. S. PAT. OFF.
DIESEL ENGINES • TRACTORS
MOTOR GRADERS
EARTHMOVING EQUIPMENT

CATERPILLAR TRACTOR CO.
Box MW-79, Peoria, Illinois

Send me specifications on the new "Cat" Diesel Engines and Electric Sets.

Name_____

Address_____

_____

PIPE

VALVES • FITTINGS

New and Reconditioned

Pacific guaranteed reconditioned pipe is clean, straight, rethreaded, water pressure tested to 350 lbs., and dipped in hot, tasteless asphaltum for longer life.

Big Stocks • All Sizes

ECONOMY PRICED

Write for details and prices

Pacific Pipe Company

401 Folsom Street
San Francisco 5, Calif.

W. A. PLUMMER
MANUFACTURING COMPANY
Established 1900

CLOTH BAGS W. A. PLUMMER MFG. CO. CANVAS PRODUCTS

Cloth Bags
Canvas Products

Special Industrial Fabrics
For All Phases of the Mining Industry

752 S. San Pedro St., Los Angeles 14, Cal.

MINING WORLD

with which is combined

MINING JOURNAL

The Production Magazine of the Metal Mining Industry

Published at

SAN FRANCISCO, CALIFORNIA

$3.00 Per Year ..... 13 Issues

(Includes Mine Development and Directory Number)

PROSPECTORS, Engineers . .
For You, the

CHICO PAN

the pocket-size gold pan used for sampling and panning. Chrome-Nickel Stainless Steel Sent Postpaid for $2.00

Write: A. O. BARTELL
Mining Engineer
321-E Platt Bldg., Portland 5, Ore.

Southwest

(Continued from Page 69)

A major uranium discovery has been reported from the Vermilion Cliffs area of Northern Arizona, about 10 miles south of the Utah border and eight miles west of Lee's Ferry. The discovery was made by Mrs. Maggie Baker of Williams, Arizona, who was searching the canyon for specimens of petrified wood. At her request, the deposit was examined by Charles H. Dunning and Roger Manning, director and engineer, respectively, of the Arizona Department of Mineral Resources. Dunning classified the mineral, which occurs as a canary-yellow mineral within the petrified wood, as radio-active carnotite. According to preliminary estimates, the deposit consists of about 200 tons of petrified logs, containing about three percent uranium lying on the surface. Other logs of similar content are believed to lie beneath the surface. The carnotite is easily extractable when in this form.

Extensive gold mining operations are reportedly planned by *Fischer Mines* this season at its holdings in the New River area near Weaverville, California. The company, controlled by William Fischer, Ned Yenter and associates, owns 14 claims in the district, holds options on five others and is developing the *Metal Maker* mine. Nine veins are said to be available for mining on the property, which is equipped with a pilot plant. One vein opened in the Metal Maker on the 320′ level is said to show good gold values.

The Jackass or Zinc shaft of the *Copper Hill* mine in Amador County, eight miles west of Plymouth, California, is now being reopened and retimbered by Victor Bonnefay and Clarence Miller. Investigations are also being made by the operators as to the economic feasibility of treating old dumps of copper and zinc sulphide.

L. V. Storrs, operator of the *Never Sweat Mine*, near West Point in Calaveras County, California, reports that a twenty ton mill is being erected on the property to treat the ore. The plant consists of a three stamp mill for the course grind, followed by a 3x4′ Strab ball mill for secondary grinding, amalgamation plates, concentrating table and flotation. Four ore shoots have been developed with average to good values on the four faces. Enough ore is blocked out to warrant the mill, which should be ready for operation by August 1. The old workings have been cleaned out and new drifts run to the south along the course of the vein. The property joins the Blazing Star Mine which has produced upwards of a million dollars.

Copper - gold - silver shipments were recently started to the smelter at Garfield, Utah, from the *New Trail* mine, 26 miles west of Nipton, California. Recently taken under bond and option by W. H. Hile, California mine operator, the property is said to contain reserves approximating 20,000 tons of mill grade four percent copper ore. The mine is developed by the 300′ reconditioned Anchor shaft.

The well-known *Hayden Hill* gold mine, 15 miles northeast of Adin, California, was recently purchased from the *Lassen Eagle Mining Company* by Herstle Jones of Emigrant Gap and Thomas Goff and Ray Zanini, gold mine and mill operators. The new owners are reportedly planning immediate production, with the ore being hauled to the nearby Goff-Zanini mill.

The *Mt. Diablo Exploration Company*, Walter Shamel of Los Angeles, president, is said to be contemplating the removal of a mill from a nearby property to its Mt. Diablo gold mine near Copperopolis, California. According to company officials, diamond drilling has opened ore below the old workings.

Radioactive Specimens

Following the recent publicity regarding uranium discoveries in Arizona, the State Department of Mineral Resources announces that it has been besieged with country-wide requests for samples. The Department of Mineral Resources cannot make a charge for samples and has been "cleaned out" of specimens. Consequently, the proper place to direct inquiries is to the Arizona Assay Office, 815 North 1st Street, Phoenix, Arizona. This concern has kits of standardized samples and typical specimens for sale for $5.00.

The *Tonopah Development Company*, subsidiary of *Calumet and Hecla Copper Company* of Michigan, is now drilling its eighth hole on a large block of ground north of Tonopah, Nevada. Due to the fractured condition of the formation, as encountered in the preceding seven holes, solid cores are difficult to obtain, and progress has been retarded somewhat. The number of holes yet to be drilled is unknown; however, the drilling program, now approaching its second year, has covered a longer period than originally planned.

Nevada - Massachusetts Tungsten mine, Mill City, Nevada, has closed for an indefinite period. President

(Continued on Page 76)

NEW METHODS—NEW EQUIPMENT

MANUFACTURERS' PERSONALS

CHARLES L. WOOLRIDGE, JR., has been appointed manager of sales training of the U. S. Steel Corporation of Delaware.

EADS JOHNSON, JR., received appointment as assistant vice-president of the Southern Wheel Division of the American Brake Shoe Company.

ALLAN CRAIG, sales manager of Link-Belt Company's southeastern division is being transferred to Houston, Texas, as general manager of the southwestern division.

PAUL B. ENTREKIN, former vice-president and manager of Bethlehem Chile Iron Mines, has been appointed general manager of the mining division.

GEORGE L. STAUDT has been appointed advertising and sales promotion manager of Harnischfeger Corporation of Milwaukee, Wis.

DR. JAMES R. DUDLEY and JOHN D. McPHERSON have been appointed Supervisor of New Production Development and Supervisor of Market Research Activities of the American Cyanamid Company.

JACK B. BOND

has been appointed district manager of the Central Territory for the Crusher and Process Machinery Division. He will headquarter in Milwaukee.

J. G. WIEGAND and R. R. McKIEL have been appointed sales engineers of the International Harvester Company's Industrial Power Division, specializing in the sale of International Harvester industrial power products to manufacturers.

GILFRY WARD has received appointment as vice-president in charge of sales of the American Manganese Steel Division of the American Brake Shoe Co.

J. W. ADELUNG is now manager of Mack-International Motor Truck Corporation's Brooklyn Branch. W. A. BRADY has been announced as manager of the company's White Plains, N. Y. Branch.

ROY F. ANDERSON'S appointment as mechanical engineer with the Pacific Pipe Company of San Francisco has recently been announced.

J. D. GREENSWARD has been appointed general manager of the Norwood, Ohio, works of Allis-Chalmers Manufacturing Company.

Cummins Expands Service To NW Equipment Users

To achieve a more central location for serving Cummins Diesel users in the Pacific Northwest, the Northwest regional office of Cummins Engine Company, Inc., of Columbus, Indiana, has moved from Portland, Ore., to 809-10 Securities Building, Seattle.

Opening of expanded facilities on Highway 99 for Cummins Service and Sales, Bakersfield, Calif., to serve Cummins customers in Kern County and the adjacent area has been announced by J. H. Flanagan, President of Cummins Service and Sales, Los Angeles, Calif., distributors of Cummins Diesel Engines for Southern California.

New Two-Way Dump Car By Alameda Firm

The "Paceco Mine Car," a dual pivot tilting dump car for 18" standard track and made in two sizes: 16 cu. ft. and 20 cu. ft., is now being produced by The Pacific Coast Engineering Company, Alameda, California. Both sizes allow 45 percent tilt for dumping over both front end and side, and Timken tapered roller bearings with Labyrinth dust seals assure easy rolling with heaviest loads.

The "Paceco Mine Car" body is constructed of heavy steel plate fusion-welded, independent cast-steel wheels, with extra wide face, and special flanging, plus other design improvements which give added strength and roadability, speed and ease of operation, increased overload factor, and greater safety. The new car represents a complete re-design of the standard mine car . . . bringing it up to date in line with the requirements of current methods and conditions in the industry.

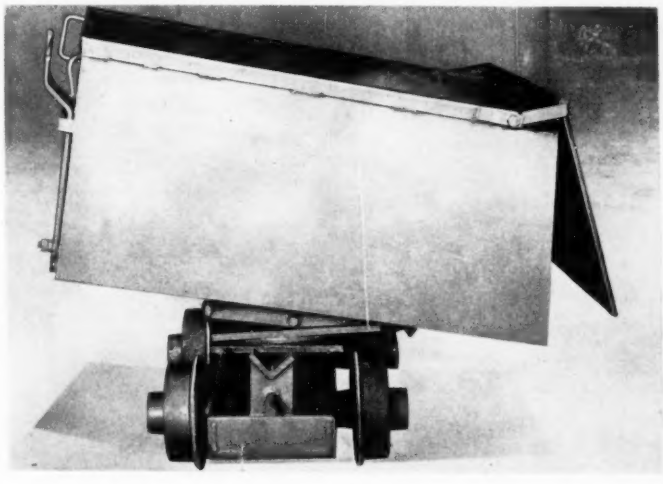
Dow Laboratory Moved To New Quarters

The Industrial Applications Laboratory of The Dow Chemical Company moved from Ann Arbor, Michigan, to new and larger quarters in Bay City, Michigan, on May 16. The laboratory had operated in Ann Arbor for about ten years under the name "Ann Arbor Laboratory" on investigational work chiefly concerned with the industrial application of Dow materials.

Laboratory Director Dr. O. C. Cessna, his assistant, Edward O. Ohlmann, and six other key employees made the shift, while several technicians will be added locally to bring the staff back up to its normal complement.

The new location affords some 10,000 square feet of floor space, approximately four times that formerly available, and will permit more effective operation and the use of larger scale equipment.

Paceco Two-Way Dump Car



PROFESSIONAL DIRECTORY

One-Inch Card, $35 Yearly—½-Inch, $20 Yearly. Payable in Advance.

ACME DRILLING SERVICE
Ore, Gravel and Water Prospecting
Keystone Churn and
Diamond Core Drilling
Surface and Underground
832 Cleveland St. Oakland 6, Calif.

Anderson, Richards & Spencer
Registered Mining and Metallurgical Engineers
Box 401 Palmer Building Baker, Oregon

ARIZ. TESTING LABORATORIES
CLAUDE E. McLEAN, REGISTERED ASSAYER
Analytical and Consulting Chemists
Box 1888 823 E. Van Buren Phoenix

Flotation Reagents
BEAR BRAND XANTHATES
SUNNY SOUTH D. D. PINE OIL-A
Complete line of all standard flotation reagents, also metallurgical and assay chemicals carried in stock.
H. J. BARON COMPANY
805 Mills Building
EL PASO TEXAS

ORE SAMPLERS & SHIPPERS' AGENTS
Beach & Company
Phone 258—P. O. Box 574
131 E. Eighth St., Leadville, Colo.
Branches at Amarillo and Dumas, Texas. All Utah smelters and other places by arrangement. Address all communications to the Leadville office. Oldest, most reliable.
Rates reasonable.

SHIPPERS' REPRESENTATIVES
at Tacoma Smelter for over 35 years
Control and Umpire Assaying
BENNETTS
Chemical Laboratory, Inc.
1131 Market Street • Tacoma 3, Wash.

B. W. DEASON V. E. WORSLEY
BLACK & DEASON
Assayers and Chemists
Ore Shippers Represented at all Smelters
P. O. Box #1888 Salt Lake City, Utah

F. J. BOODY
ASSAYER and MINING ENGINEER
648 W. Oro Street Tucson, Arizona
Phone: 6336-W

CLARK, ADDISON N.
Consulting Mining Engineer and Geologist
Syndicate Bldg., 1440 Broadway, Oakland, Cal.
ELECTRO-GEOPHYSICAL SURVEYS

THE COLORADO ASSAYING CO.
ASSAYERS, CHEMISTS, and
SPECTROGRAPHERS
Est. 1900
Charges: Gold 75c, Silver 75c, Copper 75c. Send for Free Copy of Our Mineralogist's Pocket Reference Giving Detailed Information on All the Principal Ores.
2013 WELTON ST., DENVER 1, COLORADO

C. Ivan Nichols Wm. J. Deason
DEASON & NICHOLS
ASSAYERS AND CHEMISTS
Supervision of Ore Sampling at Smelters
160 S. W. Temple St., Salt Lake City 1, Utah

DIAMOND DRILL
Contracting Company
S. 18 Stone Spokane 15, Wash.
"DIA-HARD" CORE BARRELS
AND
DIAMOND DRILLING SUPPLIES
Core and Churn Drill Contractors

EL PASO TESTING LABORATORIES
Umpire Assayers — Chemists — Metallurgists
Shippers' Representatives
At:
El Paso Smelter—Phelps Dodge Refinery
For Ores and Scrap Metals
P. O. Box 1565, El Paso, Texas

R. L. GILMORE, E. M.
AND ASSOCIATES — ENGINEERS
Mining—Petroleum—Chemical—Metallurgical
Geological Examinations and Reports
Mine Examinations—Mine Management and Operation—Ore Analysis
GEOPHYSICAL EXPLORATION
625 E. Broadway Long Beach 2, Calif.

GOODALL BROTHERS
ASSAYERS AND CHEMISTS
SHIPPERS' REPRESENTATIVES
Established 1909
Helena Montana

HAMILTON, BEAUCHAMP & WOODWORTH
Metallurgical and Mechanical
Consulting Engineers Ore Testing
Design, Construction, Operation of Milling Plants
564 Market Street San Francisco 4, Calif.

HANKS, INC., ABBOT A.
ASSAYERS AND CHEMISTS
Supervision of Sampling at Smelters
Laboratory Ore Tests
624 Sacramento St. San Francisco

HAVLICK DIAMOND DRILLING CO. INC
ANY PLACE - ANY DEPTH - ANY TIME
CORE & BLAST HOLE CONTRACTOR
1509 W. 2ND AVE., SPOKANE 9, WASH

HAWLEY & HAWLEY
W. E. HAWLEY, Mgr.
Assayers, Chemists, Ore Buyers
Shippers' Representative
P. O. Box 1060 Douglas, Arizona

HERMAN, JOHN
ASSAYER AND CHEMIST
Complete Qualitative Spectrographic Analysis
I Do Not Guarantee Satisfaction
I Guarantee Accuracy
920 Santee St. Los Angeles 15, Calif.

GEOPHYSICAL SERVICE
Since 1932
CHAS. A. ISHAM
230 Redwood Ave.
N. Sacramento 15, Calif.

HERBERT BANKS JOHNSON
CONSULTANT
Electrostatic Separation
Process Developments
76 Elmwood Ave. Rochester 11, N. Y.

SHERWIN F. KELLY
GEOPHYSICAL SERVICES, INC.
Room 318, 900 Market Street
Wilmington, Delaware

Laucks Laboratories'
"185 MINERALS and HOW TO IDENTIFY THEM"
is the best guide obtainable.
50¢
Per Copy
1008 Western Ave. • Seattle

LAMBERT-LENT LABORATORIES
Assayers — Chemists — Metallurgists
Professional Engineers
Rapid and Accurate Personalized Service
2232 Third Ave. Phone: Seneca 2224
SEATTLE, WASH.

H. GRATTAN LYNCH
Geologist and Mining Engineer
Evaluation, Development, Management
Mines and Oil Lands
742 Peyton Building — Spokane 8, Wash.
2790 Bayside Walk — San Diego 8, Calif.

JOSEPH T. MATSON
CONSULTING MINING ENGINEER
Examinations — Appraisals — Operations
216 Radio Plaza, P. O. Box 170, Santa Fe, New Mexico

The MERRILL COMPANY
ENGINEERS
Hobart Bldg. 582 Market St.
SAN FRANCISCO, CALIFORNIA

ARNOLD H. MILLER
CONSULTING ENGINEER
ROBERT LEROY HALLETT, ASSOCIATE
General Mine, Mill and Industrial Appraisals, Plant Design, Mechanization
Cable: "ALMIL" Tel. Cortland 7-0635
120 Broadway New York City 5, N. Y.

STANLEY M. MOOS
MACHINERY CONSULTANT
El Paso, Texas—P. O. Box 321
100 Texas St. Tel. 2-6538
CABLE ADDRESS "MOOS"
Mexico, D. F. Apartado 215

MURPHY, F. M.
Consulting Mining Geologist
1201 Maryland Parkway, Las Vegas, Nev.

RODGERS PEALE
Consulting Mining Geologist
315 Montgomery St. San Francisco 4, Calif.

ROOT & SIMPSON, INC.
Metallurgical Chemists and Assayers
P. O. Box 2069 Denver 1, Colo.
Established 1902

Smith-Emery Company
•
Assayers
Chemists
Engineers
Mill Tests and Design
Ore Shipments Certified
•
920 SANTEE STREET, LOS ANGELES

R. J. TREMBLAY was recently appointed general superintendent of Bethlehem Pacific Coast Steel Corporation's Los Angeles steel plant.

GM Sponsors Program For Sales Engineers

One of the most comprehensive and extensive training programs ever engaged in by an engine manufacturer in behalf of its retail sales personnel has been launched by the Detroit Diesel Engine Division, General Motors Corporation. Sales engineers from its entire nationwide industrial and petroleum distributor and dealer organization are attending a series of two week conferences in Detroit, Michigan, which is to provide them with the latest information on sound industrial engine application techniques as applied to the General Motors Series 71 Diesel engine.

Conference sessions are divided into two major parts. First week training is devoted to a thorough study of the basic GM Diesel engine, its components and operating characteristics. Every part and functional system is presented in detail by skilled service instructors.

Second and final week of the conference is spent in proper analysis of power requirements, suitable drive arrangements and important factors to consider in recommending GM Diesel engines for driving specific types of machinery.

Facts About Government Procurement Available

Complete and accurate facts about government procurement, showing how easy and profitable it is for manufacturers to get government business, are now available in a new U. S. Government Procurement Brochure edited by experts in the various operations and workings of procurement.

Of great value to both manufacturers who have never submitted a bid, and to those manufacturers who have been active government bidders, this brochure dramatizes in easy-to-follow, easy-to-read language, the many short-cuts to successful bidding and successful execution of valuable government contracts.

The bulletin may be obtained by writing to Superintendent of Documents, Washington, D. C.

FRED W. SHERMAN
Consulting Mining Engineer
Mine Examinations, Mineral Examinations, Mine Surveying and Mapping, Reports and Estimates.
1550 Montgomery Street, Oroville, Calif.

W. H. STOWELL & CO.
Chemists and Assayers
421 Sprague Ave. Spokane, Wash.
Estb. 1890

SEAL-TITE TAMPING BAGS
Save Time and Money in handling Dummies
High wet strength and toughness withstand humidity and hard handling. Supplies of dummies are made up quickly and can be stored underground under wet conditions. Send for samples.
Tamping Bag Co.
210 S. THIRD ST.
MT. VERNON, ILL.

SEWELL THOMAS
Consulting Mining Engineer
Plant Layout • Design • Detailing
Mechanization • Mining Methods
380 Gilpin St. Denver 3, Colo.

CARL TRISCHKA
Consulting Registered Geologist
Mining Engineer
Mine Examinations, Water, Reports
Box 402 Bisbee, Arizona

UNION ENGINEERING CO.
MINE EXAMINATIONS
DESIGN AND CONSTRUCTION OF MINING PLANTS AND MILLS
510 So. Spring St., Los Angeles 13, Calif.
Tel. MU 8550

PLACER DREDGES
Dragline fed floating and Dryland Placer Dredges. Universal Portable Placer test machine for immediate deliveries. Your inquiries invited.
UNIVERSAL DREDGE MFG. CO.
609 Security Life Bldg.
Denver 2, Colorado

VAN WATERS & ROGERS INC.
Flotation Chemicals • Mining Reagents
Largest and Most Complete Stocks in Northwest
Seattle, Spokane, Portland, Boise

WOOD ASSAYING CO., HENRY E.
Established 1878
ASSAYERS and CHEMISTS
2042 Broadway Denver 2, Colorado

THE MARKET PLACE

FOR SALE

1—2,000 c.f.m. Worthington two-stage compressor with 350 HP direct connected synchronous motor 3/60/2200.
1—230 c.f.m. Gardner-Denver Model WBQ compressor with 50 HP 3/60/440 built-in motor.
1—500 c.f.m. Allis-Chalmers rotary compressor or vacuum pump.
2—Oliver vacuum pumps, 9½ x 8 and 14½ x 8 sizes.
1—Allis-Chalmers 4' x 8' double-deck vibrating screen.
1—150 HP double-drum mine hoist. Lilly controller.
1—100 HP Denver Eng. Wks. double-drum hoist.
1—50 HP single-drum mine hoist.
1—60 HP single-drum mine hoist (Ottumwa).
1—20 HP single-drum mine hoist.
1—Eimco Model 21 mine car loader, 24" gauge.
1—Apron feeder, 42" x 16' 6".
1—65' bucket elevator.
2—6' x 23' 6" Dorr classifiers.
18—¾-ton 18"-gauge end dump mine cars.

Large stock of mine cars, pipe, rail, etc.
Send us your inquiries.

F. J. SULLIVAN
672 Santa Ray Ave. • TWinoaks 3-8342
OAKLAND 10, CALIF.

MACHINERY
IMMEDIATELY AVAILABLE

1—984 c.f.m. I. R. air compressor
1—125 HP. Washington cableway hoist
1—75 HP. single drum Thomas mine hoist
1—125 HP. 720 RPM 440 volt slipring motor
1—I. R. Model EUA sgl. drum air hoist
1—Bristol recording pyrometer, to 1,600° F.
22—Quicksilver flasks
1—3' x 6' Kennedy Van Saun ball mill, electric power
1—16" x 24" Denver duplex jig
1—18" Bendelari utility jig
1—27" UIW simplex classifier
1—24" x 36" Farrel Bacon jaw crusher
1—20" Allis Chalmers McCully gyratory crusher
1—104 HP. Hercules DRXB diesel engine
1—12" x 50' belt conveyor
1—16" x 10" Sturtevant roll crusher

WRITE, WIRE OR PHONE

WASHINGTON MACHINERY AND STORAGE COMPANY
7329 E. Marginal Way, Seattle 8, Wash.
Phone: RAinier 1123

MINES — MILLS
•
RAILROADS
•
MACHINERY
•
COMPLETE PLANTS
BOUGHT—SOLD LIQUIDATED

DULIEN STEEL PRODUCTS, INC.
of Washington
9265 E. MARGINAL WAY
LANDER 6000
SEATTLE 8, WASH.

MINE HOISTS: 1—All steel, single drum, 8 ft. dia., 1½" rope, 64,000 lbs. single line pull, 600 FPM, 400 HP., 2200 volt, AC, with all control equipment.
1—600 HP. single drum, 8'x12' with motor 2200 volt, AC, and controls.
1—250 HP. single drum, 7'3"x5', 30,000 lbs. single line pull, 7500 FPM, complete.
1—200 HP. single drum, 42" face, 60" dia., AC, 2200 volts and controls.
1—150 HP. double drum, 38" dia., 42" face, 440volt, AC, complete with controls.
HARDINGE MILLS: Conical Ball Mills 6'x22", 8'x20", and 8'x30", manganese steel lined, Herringbone gears, with motors and V-belt drive.
CONVEYOR BELT: Large quantity Goodrich Super Long Life Cord Conveyor Belt, 42" wide, 6 ply, 42 oz. duck, 7/32" top cover, 1/16" bottom cover, on original reels, all NEW, NATURAL RUBBER, with or without mechanical parts.
JAW CRUSHER: Farrel model 15-B, size 36"x24".
DRYER, KILN OR COOLER: 10'x90' heavy duty type, with dust collector and all auxiliary equipment.

A. J. O'NEILL
Lansdowne Theatre Bldg., Lansdowne, Pa.
Phila. phones: MAdison 8300 - 8301

Market Place Advertising

360 inches	$4.50
180 inches	$5.00
90 inches	$5.50
45 inches	$6.00
Less than 45 inches	$6.50

Contract rates based on total number of column inches used within one year.
30 column inches equal one page.
Closing date: 1st of month preceding publication.
(Used and reconditioned equipment, liquidations, property sales only)
For additional 10,000 WORLD MINING export distribution: Add 50%

Southwest

(Continued from Page 72)

C. H. Segerstrom announced that low metal prices, competition from new tungsten producers in the area and low demand for tungsten are the causes of the famous mine's shutdown. Close to a world's record in tungsten in its several decades of operation have been produced at the mine. The shutdown will put 161 men out of work.

The *Winnemucca Mountain Mines Company*, Winnemucca, Nevada, has started driving its tunnel an additional 1,000' to connect with the long dormant *Rexall* property, formerly a bonanza producer. The company has also installed a pilot plant of 20-ton capacity which was ready for operation June 1.

According to Leland Casey, mining man of Rawhide, Nevada, a 50-ton capacity mill near Deadhorse Wells is ready to accept custom ore. The plant, which was built last year and is owned and operated by Charles Milan, is treating the dump and new ore of four or five gold and silver operators in the Rawhide district.

The *Black Diablo* manganese property, 21 miles south of Golconda, Nevada, has been reopened by *Charleston Hill National Mines, Inc.*, and shipments started to the Geneva Steel Corporation at Salt Lake City. It is planned to maintain a monthly production of 12 carloads. Mrs. Mary Clough is company president.

Operations have been resumed by the *Castle Mountain Mining Company* at its *Hirshell* and *Jack Pot* properties near Austin, Nevada. At present, development work is progressing in the Bartlett tunnel and Castle shaft, and the 25-ton capacity pilot plant will be placed in operation soon. Ore values are in silver, lead, zinc and copper.

Development operations are being pushed by Frank May and Eddie Clark at their fluorspar claim in the Quinn Canyon Range, 75 miles east of Tonopah, Nevada. The deposit was discovered last fall when May found a series of veins cutting through a rhyolite flow. Present work is concentrated on a showing of high-grade rock from which it is hoped to obtain enough ore for a 100-ton shipment. If a substantial tonnage is guaranteed, a five-mile road to the property will be built.

The *Nevada Uranium Production Company* of Tonopah, Nevada, is now sinking a winze from the tunnel level of its *Rainbow* group of seven claims which it holds under option from the Henneberg Brothers. According to Manager W. J. Loring, 11 samples cut the entire length of the 352' tunnel about 30" apart and over a width of 6' from wall to wall have all shown the presence of uranium-bearing ore as well as gold and silver.

MINE & MILL EQUIPMENT—REBUILT & GUARANTEED

BALL MILLS

1—No. 64 Marcy
1—No. 45 Marcy
1—6x7 Allis-Chalmers

DIESEL GENERATORS

3—D-13000 Caterpillar Diesel Engines, direct connected to 75 KW, 440 volt AC Generators
1—D-4400 Caterpillar Diesel Power Unit, V-belted to 220 volt AC Generator (will sell with or without generator)

PUMPS—SAND

1—2" Split Case Wilfley Pump—rubber-lined—motorized
3—2" Wilfley Pumps—solid bowls—rubber lined—motorized
4—2" Wilfley Pumps—motorized

CLASSIFIERS

1—6' x 22' Dorr Type Duplex Rake Classifier
1—60" x 23' Denver Equipment, Simplex Cross Flow Classifier

THICKENERS

1—16' x 10' Dorr, Wood Superstructure and Tank
1—20' x 8' Dorr Type Steel Superstructure, Wood Tank
1—20' x 8' Booth-Thompson, Steel Superstructure, Wood Tank
(All units complete with motors and pumps)

WAGON DRILLS

1—Sullivan #LW-6, on steel wheels, with drifter, etc.
1—Ingersoll-Rand with pneumatic tires, drifter, etc.

SLUSHER HOIST

1—Ingersoll-Rand, 3-drum, with built-in 50 HP AC motor with two 1½ Yd. Scrapers (used 30 days)

VIBRATING SCREENS

1—3' x 6' Plat-O, motorized
1—3' x 6' Tyler-Niagara, motorized

FILTERS—DISC

1—4', 6-disc, Eimco, with vacuum equipment

SAMPLE CUTTERS

4—Gen. Elec. Wet Sample Cutters, with auto. timers and ½-HP single phase gear motors

FLOTATION MACHINES

4—No. 24 Denver "Sub-A" with wood tanks

BELT CONVEYORS

1—30", approximately 30' centers, on 6" steel channel iron frame, with 2-HP gear motor
1—24", 5' 6" centers, with 24" x 26" Dings pulley, charger, etc.

PUMPS—CENTRIFUGAL

2—RV-1 Ingersoll-Rand Motor Mounted
2—1½RV-3 Ingersoll-Rand Motor Mounted
1—2RV-3 Ingersoll-Rand Motor Mounted
1—2RV-7½ Ingersoll-Rand Motor Mounted
1—RVH-10 Ingersoll-Rand Motor Mounted
3—2RVH-15 Ingersoll-Rand Motor Mounted
1—3RVH-25 Ingersoll-Rand Motor Mounted

COMPLETE LISTING MAILED UPON REQUEST

FLORENCE MACHINERY & SUPPLY COMPANY

Suite 904 Equitable Bldg. C. J. PARRISH, *Mgr.* **Denver 2, Colorado**

MINING AND MILLING MACHINERY
ELECTRICAL, INDUSTRIAL and CONSTRUCTION EQUIPMENT

LOCOMOTIVES

2—2 to 2½ ton Mancha Battery Locomotives, 18" gauge
1—2½-ton Whitcomb Battery Locomotive, 24" gauge
1—7-ton Mancha Battery Locomotive, 36" gauge
2—7-ton General Electric Battery Locomotives, 36" gauge
2—8-ton General Electric Battery Locomotives, 36" gauge
4—10-ton Atlas Battery Locomotives, 36" gauge
1—3-ton Ruth Gasoline Locomotive, 18" gauge
1—3-ton Whitcomb Gasoline Locomotive, 24" gauge
3—6½-ton General Electric Trolley Locomotives, 36" gauge

BLOWERS

1—6½" x 22¾" Roots Rotary Positive Pressure Blower
1—10" x 18" New Sutorbilt Rotary Positive Pressure Blower
1—8½" x 29¾" Roots No. 1 Rotary Positive Pressure Blower
1—16" x 36" Roots No. 5 Rotary Positive Pressure Blower
1—16" x 48" Cornersville No. 5 Rotary Positive Pressure Blower
1—24" x 72" Roots No. 7 Rotary Positive Pressure Blower
37—New Type HS American Volume Blowers, complete with motors (16 AC and 21 DC)
1—Buffalo No. 6 "Silex" Conodial Blower
4—Mueller No. 24-5R New Volume Blowers
1—North American 825 cfm. Furnace Blower, direct driven by 7½-HP G. E. totally enclosed motor

LOADERS

3—No. 12-B Eimco Rocker Shovel Loaders, 18" gauge
1—No. 20 Eimco Rocker Shovel Loaders, 24" gauge
2—No. 20A Conway Mucking Machines, 24" gauge
4—No. 50A Conway Mucking Machines, 24" gauge
1—Northern Portable Unloader Conveyor, 14" wide by 14' 4" long, driven by 6-HP Wisconsin gas engine
1—Farquhar Portable Unloader Conveyor, 18" x 18', powered by 4-HP Briggs & Stratton gas engine

JAW CRUSHERS

1—8" x 8" Universal, semi-steel
1—9" x 15" Cedar Rapids, all steel
1—9" x 16" New Morse Bros., cast iron frame, manganese jaws
1—9" x 24" Rogers, cast steel
1—8" x 36" Universal, all steel
1—15" x 20" Universal, all steel
1—24" x 36" Traylor, Type A Blake

MISCELLANEOUS EQUIPMENT

1—Ainlay Type C New Centrifugal Gold Separator
1—Williams 26" x 18" Hammer Mill Pulverizer
1—2" Wilfley Sand Pump
1—27" x 14" McFarlane Crushing Roll
1—3' Symons Cone Crusher
1—3' x 4' Oliver Drum Filter
2—3' x 5' Tyler 'Hummer' Vibrating Screens
1—8¼" Telescope Gurley Transit
1—11" Telescope Gurley Transit
1—Sullivan Class B Diamond Drill, steam operated
2—Jeffrey Type 2A New Vibrating Feeders

BALL AND ROD MILLS

1—30" x 24" new Morse Bros. batch ball mill
1—4' x 4' new Ball Mill
1—6' x 8" Marcy Ball Mill
1—8' x 22" Hardinge Conical Pebble Mill
1—3' x 8' Denver Engineering Company Tube Mill
1—3' x 9' Ruth Rod Mill
2—6' x 36" Hardinge Conical Ball Mills
1—6' x 48" Hardinge Conical Ball Mill

SLIP RING MOTORS

1—10 HP G. E. 3/60/220, 900 RPM
1—15 HP Fairbanks Morse, 3/60/400, 900 RPM
1—20 HP G. E. 3/60/440, 720 RPM
3—20 HP G. E. 3/60/200-440, 1200 RPM
1—50 HP Westinghouse, 3/60/440, 1160 RPM
2—52 HP G. E. 3/60/220-440, 600 RPM
2—52 HP G. E. 3/60/220, 900 RPM
1—75 HP Westinghouse, 3/60/440, 720 RPM
1—82 HP G. E. 3/60/440, 495 RPM
2—165 HP G. E. 3/60/440, 430 RPM
1—200 HP G. E. 3/60/220-440, 435 RPM
1—20 HP Allis-Chalmers, 3/60/2200, 960 RPM
2—50 HP G. E. 3/60/2200, 900 RPM
1—300 HP G. E. 3/60/220, 590 RPM

GYRATORY CRUSHERS

1—No. 6 Kennedy-Van Saun roller bearing
1—No. 37 Kennedy-Van Saun type 8 roller bearing, fine reduction crusher
1—16" Traylor "Bulldog" type T crusher

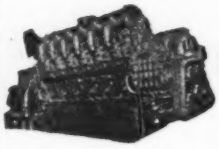
RAIL

6—tons new 16-lb. mine rail
11—tons new 20-lb. mine rail
6—tons 40-lb. relaying rail
37—tons 85-lb. relaying rail

Extensive stock of fully reconditioned machinery. Send for bulletin 481-M.

MORSE BROS. MACHINERY CO.

2900 BRIGHTON BLVD. • DENVER, COLORADO • ESTABLISHED 1898



DIESEL GENERATOR PLANTS

1,000 KW TO 100 KW

IMMEDIATE DELIVERY

1000 KW, 2400 Volts, 3 Phase, 60 Cycle, 720 RPM, General Motors and Fairbanks-Morse
750 KW, 2400 Volts, 3 Phase, 60 Cycle, 720 RPM, General Motors
300 KW, 450/2400 Volts, 3 Phase, 60 Cycle, 1200 RPM, General Motors
100 KW, AC or DC, 1200 RPM, General Motors
900 HP, General Motors, Propulsion Unit Complete
General Motors Quads, Twins, and Singles
Fairbanks-Morse O.P. Model 38D-8 1/8 Diesel

HERCULES ELECTRIC MACHINERY and EQUIPMENT CO.

Tel. NEvada 6-2808 — 1412 South Alameda Street
Cable Address HEMCOY — Compton 1, California.

ALLISON STEEL MANUFACTURING COMPANY

Mine and Mill Buildings • Mine Rails • Ore Cars • Steel Gallows Frames • Ball Mills Muck Plates • Crucible Drill Steel

---

● We offer a complete repair service to the Mining Industry. Our new Machine Shop is equipped to handle your work quickly and economically.

Hot Milling of All Types of Detachable Bits

SOUTH 19th AVENUE
PHOENIX ARIZONA
PHONE 3-5161

WIRE ROPE

Plow and Improved Plow
50% LESS
THAN MANUFACTURERS' COST!

Brand New — Guaranteed — Manufactured by Nationally Known Firms. From 1/2" to 2 3/4" dia.—From One Reel to 2,000 Tons!

Phone, Write, or Wire for Complete Inventory and Price List.

WEST COAST METAL PRODUCTS CO.

1040 Bryant St., San Francisco 7, Calif. • Phone UNderhill 1-5129

FOR SALE

Small Boyles Bros. diamond or core drill with capacity limit of 200 ft. Seven-eighths inch diameter core, complete Briggs Stratton engine driven. Almost new. Larger improved pump with separate gas engine added. 150 feet of rods, one facing or starting bit, and one 5' and one 10' barrel included. Price $900 as is, ready to use. Also have two additional new bits and several partly used bits. Address D. S. Holmes, Nehalem Hotel, Vernonia, Oregon.

Style 38

We Have in Stock

DRESSER COUPLINGS

All Sizes

Bolted and Boltless Types

Permanent Joints for Steel and Cast Iron Pipe

PACIFIC PIPE COMPANY

401 Folsom Street — San Francisco 5

CHANGE OF ADDRESS

CIRCULATION DEPARTMENT
MINING WORLD with which is combined the Mining Journal
121 Second St., San Francisco 5, Calif.

Please change the address of my Mining World subscription.

NAME .....

OLD ADDRESS .....

NEW TITLE OR POSITION .....

NEW ADDRESS .....

NEW COMPANY CONNECTION .....

THE MARKET PLACE

Flotation metallurgist, U. S.	$400
Mine shift boss, U. S.	375
Mine engineer, U. S.	375
Chemist, metal, U. S.	250
Mine geologist engineer, U. S.	345
Junior metallurgist, U. S.	250
Mine foreman, U. S.	350
Mine shift boss, U. S.	335
Mechanical engineer, U. S.	400
Assayer, U. S.	275
Electrical engineer, U. S.	400
Mine geologist, U. S.	350
Mine electrician, U. S.	350
Structural draftsman, U. S.	400
Jr. mine engineer, U. S.	250
Mill designer, U. S.	450
Journeyman electrician, U. S.	350
Mine bookkeeper, U. S.	287
Mine foreman, fgn.	400
Jr. mine engineer, fgn.	350
General mine foreman, Mexico	422
Mine foreman, Mexico	330
Mill shift boss, single, fgn.	375
Mine engineer, single, fgn.	350
Master mechanic, fgn.	500
Chief electrician, fgn.	500
Diesel electrician, fgn.	400
Asst. smelter engineer, fgn.	525
Chief mine engineer, fgn.	450
Draftsman, structural, fgn.	500
Draftsman, mechanical, fgn.	500
Cyanide mill operator, fgn.	375
Open pit engineer, fgn.	Open
Asst. mill superintendent, fgn.	Open
Senior mine engineer, fgn.	Open
Mill superintendent, fgn.	500
Stenographer, fgn.	275
Mine warehouseman, Mexico	400

BUSINESS MEN'S CLEARING HOUSE
601 Midland Savings Bldg.
Denver 2, Colorado
Established 1903

RADIATION COUNTER BY OPTRONICS

1—Sensitivity equivalent to laboratory equipment.
2—Immediate response to minute quantities of radio-active material on phones or meter. Stopwatch unnecessary.
3—New G-M tube—exclusive with **OPTRONICS**. Not obtainable elsewhere.
4—Economical operation. Requires only three portable radio batteries. No expensive special batteries needed.
5—Compact. Weight approx. 9 lbs. fully equipped.

The goal of **OPTRONICS** was to produce the most efficient portable instrument on the market. In this we believe we have succeeded. Your comparison is invited. For additional information write **OPTRONICS**, Box T-75, MINING WORLD, 121 Second St., San Francisco Calif.

Dealer inquiry invited.

3146 ft. Sullivan Class WN4, 500 HP, 3 P., 60 C 2300 Volt. Direct Connected 125 lb. Pres. Air Compressor
6 ft. x 48 in. Hardinge Ball Mill, with or without Air Separator.
#1½ Sturtevant Ring Roll Mill.
45-ton Plymouth Diesel Locomotive.
36 in. x 24 in. Traylor Jaw Crusher.
70 in. x 35 ft. Ruggles Coles XB Indirect Dryer.
8 ft. and 10 ft. Grayco Air Separators.
1—36" x 42" and 40" x 48" Buchanan Blake Type Panel Jaw Crushers.
2—74,000 Bbl. Cap. Steel Tanks.
2' 4" Traylor Ty Fine Gyratory.
30 in. Superior Gyratory A.C. Crusher.

DARIEN CORP.
60 E. 42nd ST., NEW YORK 17, N. Y.

Asst. Mine Manager, fgn.	Open
Asst. Mine Supt., E. M., fgn.	$500-$551
Open Pit F'man, U. S.	Open
Asst. Chief Mech. Engr., mine, fgn.	Open
Mine Engrs., fgn., 1 Asst. Chf.	450
Master Mech., mine, fgn.	450
Asst. Mine Supt., foreign	450
Asst. Mill Supt., flot., U. S.	350- 400
Draftsmen, Mill Designers, fgn.	350- 500
Designer, E. E. (2), Colo. and fgn.	350- 500
Elect. Engr., plant m't'ce	300
Draftsman, Struct., Mech., Arch., U. S.	400
Engineers, tool design (2)	400- 500
Civil Engrs., field, U. S., $300; fgn.	450
C. E. Construction, mtce.	350
City Engineer, Colo., C. E.	300
Research Chem. or E. Met.	400
Metallurgists, fgn., 1; open, 1	315
Smelter field engineer, fgn.	450- 500
Mine Foreman (2), fgn., E. M.	350
Jr. Mine Engrs. (2), U. S.	298
Mine Shifters, fgn., S. A. and C. A.	250- 350
Mine Shifters, U. S. (2)	335
Cyanide Flot. Shifters, fgn.	250- 375
Refinery Foremen (3), smelting, fgn.	350
Mine Engineer, fgn.	300
Chief Elect., E. E., mine, fgn.	365
Mine Warehouseman, fgn., speak Span.	400
Spanish-English Steno., fgn.	290

GLENN B. WILSON
Employment Specialists
307 CONTINENTAL OIL BUILDING
DENVER 2, COLORADO

$50 PER CLAIM
For Complete
GEOPHYSICAL AND GEOLOGICAL REPORT
Including
Maps and Cross Sections
Askania Vertical Magnetometer
WADE M. DALE, GEOPH.
266 Broadway Placerville, Calif.
PHONE 583W

FOR SALE
USED EQUIPMENT

1—36" x 24" Allis-Chalmers Superior Jaw Crusher
1—5½' Standard Symons Cone Crusher
1—4' Standard Symons Cone Crusher
2—5½' Short Head Symons Cone Crushers
8—4 x 5 Tyler Hummer Vibrating Screens
5—6 x 6 Colorado Iron Works Ball Mills: Grate discharge
2—36" Duplex Submerged Spiral Akins classifiers
1—9 x 15 Webb City Iron Works Jaw Crusher

The Golden Cycle Corporation
Mill Department
Colorado Springs, Colorado

FEDERAL PIPE & TANK CO.
—WOOD PIPE and WOOD TANKS—
Factory
and Main Office
6851 E. Marginal Way
Seattle 8, Wash.

FOR SALE

20 KW Diesel Generator
10 HP Pressure Pump
10 HP Gear hoist with 500' new cable
3 Jack Hammers
Over 100 items mining equipment.
For complete list and price, write to
MILTON R. SUTTON
8262 Norton Ave. Hollywood 46, Calif.
HEmpstead 9685

CLASSIFIED SECTION

8 pt. type 12c per word. 10 pt. type 18c per word. Minimum charge $4.50.

(For Box numbers addressed to Mining World, add 50c)

Boxed ads (display) in either Market Place or Classified Sections—$5 per column inch.
(See Market Place Section for lower contract rates)

Closing Date: If proof required, 1st of preceding month, otherwise 10th.

Miscellaneous

ANYONE KNOWING WHEREABOUTS of Darrell V. Cole, placer operator, please have him contact Pacific Eng. Mining & Trading Co., 693 Mission St., San Francisco.

WANTED—Used Drifters and Stopers. CP60's; GD89's or 104's; or IR48's and 58's, in excellent condition, at bottom prices. Write Box 1028, Grass Valley, California.

Positions Desired

MINE OR GENERAL SUPT. North American continent only. Temperate climate, U.S. preferred. Age 44, graduate mining engineer, 20 years' experience all phases. Prefer open pit. Capable handling one or more large properties. Now employed, desire other connection. Write Box T-86, MINING WORLD, 121 Second St., San Francisco, Calif.

GRADUATE MINING ENGINEER, experienced in gold and copper mining, milling also uranium and rare metals. Fair geologist, skilled miner, good manager. Desire foreman or superintendent's job, west or southwest. Reply Box T-87, MINING WORLD, 121 Second St., San Francisco, Calif.

MANAGER OR GENERAL SUPERINTENDENT. Twenty years' experience in mine design, layout, exploration, development (including shaft sinking). All types of stoping and specializing in low costs. Address Box T-84, MINING WORLD, 121 Second St., San Francisco, Calif.

DIAMOND DRILLER, 16 years' experience. Will go anywhere on permanent job. Box 926, Bishop, California.

Equipment For Sale

ASSORTED NEW PARTS for 15" x 24" Universal Jaw Crusher at substantial discounts. Box 1028, Grass Valley, Calif.

INDEX OF ADVERTISERS

Acme Drilling Service 74
Allen-Sherman-Hoff Co. ..... Inside Front Cover
Allis-Chalmers Mfg. Co. (Gen. Mach. Div.) 29
Allison Steel 78
Alloy Steel & Metals ..... Outside Front Cover (Mining World) 30
American Cyanamid Co. 7
American Forge Co. 24
American Manganese Div. American Brake Shoe Co. 26
American Potash & Chem. Corp. 57
American Smelting & Refining Co. 49
American Zinc, Lead & Smelting Company 59
Anaconda Wire & Rope 67
Anderson, Richards & Spencer 74
Arizona Testing Laboratories 74

Baron, H. J., Company 74
Bartell, A. G. 72
Beach & Company 74
Bemis Bro. Bag Co. 68
Bennetts Chemical Laboratory, Inc. 74
Bethlehem Pacific Coast Steel 4
Black & Deason 74
Bodinson Mfg. Co. (World Mining) 49
Boody, F. J. 74
Boyles Bros. Drilling Co. 21
Brill, W. D. & Co. 60
Bunker Hill & Sullivan Mining & Concen. Co. 59
Business Men's Clearing House 79

Card, C. S., Iron Works 63
Cate Equipment Co. 28, 52
Caterpillar Tractor Company 71
Central Eureka Mining Co. 53
Clark, Addison M. 74
Colorado Assaying Co. 74
Colorado Iron Works 54
Columbian Steel Tank Co. 57
Cummins Engine Co., Inc. 3

Dale, Wade M. 79
Darien Corp. 79
Deason & Nichols 74
Deister Concentrator Co. 61
Denver Equipment Company 33
Denver Fire Clay Co. 55
Diamond Drill Contracting Co. 74
Dorr Co. ..... Inside Front Cover (World Mining) 56
Dow Chemical Co. (Great Western Div.) 25
Dulien Steel Products 76

Eimco Corp. 34, 47
Eimco Corp. ..... Outside Front Cover (World Mining)
El Paso Testing Laboratories 74
Emsco Concrete Cutting Co. 19
Euclid Road Machinery Co. ..... Inside Back Covers

Federal Pipe & Tank 79
Flexible Sewer-Rod Equipment Co. 68
Florence Machinery Co. 77

Gardner-Denver Co. 43
Gilmore, R. L. 74
Golden Cycle Corporation 79
Goodall Brothers 74
Goodall Rubber Co. 53

Hamilton, Beauchamp & Woodworth 74
Hanks, Abbot A., Inc. 74
Hardinge Co., Inc. 53
Harnischfeger Corp. 39
Havlick Diamond Drilling Co., Inc. 74
Hawley & Hawley 74
Hercules Electric Mchy. & Equip. 78
Herman, John 74
Holmes, D. S. 78
Humphreys Investment Co. 35

Independent Pneumatic Tool Co. 51
International Harvester Co. 27
International Smelting & Refining Company 59
Isham, Chas. A. 74

Johnson, Herbert Banks 74

Kelly, Sherwin F. 74

Lambert-Lent Laboratories 74
Laucks Laboratories 74
Lynch, H., Grattan 74

Mace Company, The 53
Magma Copper Co. 59
Malamphy, Mark Co., & Co., Ltd. 35
Matson, Joseph T. 74
Merrick Scale Mfg. Co. 68
Merrill Company 74
Mill & Mine Supply Co. 23
Miller, Arnold H. 74
Mine & Smelter Supply 45
Moos, Stanley M. 74
Morse Brothers Machinery Co. 77
Murphy, F. M. 74

Nordberg Mfg. Co. 1

O'Neill, A. J. 76

Pacific Foundry Co., Ltd. 22
Pacific Pipe Co. 78, 72
Pacific-Western Gear 8
Peale, Rodgers 74
Peterson Filter & Engineering Co. 64
Philpott Co., George M. 23
Plummer Mfg. Co., W. A. 72

Root & Simpson, Inc. 74

Shell Oil Co. 66
Sherman, Fred W. 75
Smith-Emery Co. 75
Smith Engineering Co. 6
Standard Oil of California 70
Stowell & Co., W. H. 75
Sullivan, F. J. 76
Stulz-Sickles Co. 61
Sutton, Milton R. 79

Tamping Bag Co. 75
The Timken Roller Bearing Co. 2
Thomas, Sewell 75
Trischka, Carl 75

Union Engineering Co. 75
Union Oil Co. 14
Universal Dredge Mfg. Co. 75
University Apparatus Co. 24

Van Waters & Rogers, Inc. 75

Washington Machinery & Storage Co. 76
West Coast Metal Products Co. 78
Western Machinery Co. 42
Wilfley, A. R., & Sons ..... Outside Back Covers
Wilson, Glenn B. 79
Winston Bros. 35
Wood Assaying Co., Henry E. 75
World's Minerals 61

Yuba Manufacturing Co. 50

FOR SALE: PLACER DREDGE, UNIVERSAL DRAGLINE FED FLOATING TYPE. Electric drive. Capacity 100 cu. yd. per hour. Used only 3 months. Like new. Very low price. Also available, one electric powered, 100 ft. boom, 3½ cu. yd. Bucyrus-Erie Dragline. Good condition. Really a bargain. For full information write UNIVERSAL DREDGE MFG. CO., 609 Security Life Bldg., Denver 2, Colorado.

FOR SALE: New discovery, 5 virgin, contiguous mining claims; complex high-grade ore, gold, silver and lead. Probable deep deposit. Located in west central Arizona, climate favorable to continuous operation. Address Box T-77, MINING WORLD, 121 Second St., San Francisco, Calif.

FOR SALE: Lowney all-steel washing plant with new G.M. Diesel Electric power unit, motors, pumps and new stacker belt, all in excellent condition. Price $20,000. Inquire Russell Unrue, Alder, Montana.

FOR SALE—Complete assaying and chemical laboratory equipment. In excellent condition. Reply Box T-83, MINING WORLD, 121 Second St., San Francisco, Calif.

Business Opportunities

I WANT TO HEAR from somebody who is interested. I have a big deposit of Limonite Bog Iron. Box 143, Ouray, Colorado.

FOR LEASE

LEAD & ZINC—approx. 400 acres. Large veins crossing at about 300 feet apart, on good road.

GOLD—One of the largest deposits in the country. Low-grade, free-bearing gold ore. Power-shovel proposition. Justifies large mill. Good road.

GOLD—Two claims; good values; 8-foot vein.

GOLD—Group of claims on same vein as a large producer of high values.

MOLYBDENUM—carrying good values in gold. 200 acres. Plenty of water and timber on all groups.

Above properties all in Colorado.

By OWNERS. Box T-56, MINING WORLD, 121 Second St., San Francisco, Calif.

HIGHLY DEVELOPED COPPER MINE with large gosson deposits assaying from $5.25 to $39.90 per ton. 298 acres patented. For sale or cash and royalty. Must be reliable. Write Box 88, Happy Camp, California.

FOR SALE, LEASE, or use on shares: Long-year diamond core drill, complete with rod, pump, winch, tripod, etc. Mounted on a 1½ ton four wheel drive truck. Dillon Mining Company, 3978 32nd St., San Diego 4, California.

FOR SALE OR LEASE: Very promising and interesting gold mining property located in famous old Idaho mining district. Reply Box T-79, MINING WORLD, 121 Second St., San Francisco, Calif.

TWO PROVEN GOLD-SILVER MINES OBTAINABLE. Over $650,000 expended in intelligent development. One has production record about half million by crude hand methods. Smelter returns averaged nearly 1.50 ozs. gold, 15-25 ozs. silver, plus valuable by-products—ready market. Prolonged earning capacity rightly handled. ADJOINING PROPERTY—Two strong veins. Open cuts expose definite high grade ore shoots over long strike. 1,400 ft. Xcut intersects same ore about 800 ft. depth. Each drifted on 600-930 ft. respectively. Recent large sample representative of ore broken on low level, sent smelter, ran: 1.34 ozs. gold, 10.62 ozs. silver, 6% lead. The impediments which kept these promising properties idle, except for assessment work, past several years now removed. Will consider equitable arrangement project raise from low level to surface, or, considering selling. Recovery from ore broken during driving estimated adequate cover costs this development. Raise already started. No down-payment until raise completed. Projection of Xcut would give 600 ft. additional stoping backs below present stoped area in adjoining property. Equipped with first class mining layout, 50-75 ton mill, etc. Broad perspective. Excellent possibilities right group. Address Box T-82, MINING WORLD, 121 Second St., San Francisco, Calif.

FOR SALE: 780 acres unpatented placer mining claims containing an estimated ten million cu. yds. gold bearing gravel; estimated value 25c per yd. Property located 43 miles from Boise, Idaho, on paved road adjacent to Idaho City, in heart of famous placer mining district. Property has sufficient water and pipe to operate washing plant. For information write: J. C. Jacobsen, 321 Franklin Trust Bldg., 1243 Liberty St., Franklin, Penna.

SMALL BUSINESS (net assets of $250,000 to $500,000) net earnings from $10,000 to $25,000 per annum, with competent and good management can be assisted in finding new working capital by distribution of securities. Confidential correspondence invited. No advance fees asked. Reply FINDER SERVICE, Room 605, No. 109 Broad St., New York 4, New York.

FOR SALE

50-T cyanide plant equipped with ball and tube mills, Dorr thickeners and agitators. In good condition. On paved highways Comstock district. Reply Box T-85, MINING WORLD, 121 Second St., San Francisco, Calif.

COPPER MINE—For sale, two-thirds interest, Siskiyou County, California. 5% to 8% copper, with possibility of gold-silver at depth. 16-mile haul to railroad. Ample water, timber. Need 25-ton mill to make paying property. 12 miles good road, 4 miles fair road. Box 1793, Sacramento, California.

MINE WITH PROVEN ORE BODY. 6,000 ft. of vein. Will net $10 per ton. Equipment includes 30-ton flotation mill. Attractive terms to responsible party. Complete report available. P. O. Box 104, Mariposa, Calif.

"EUCS SURE DO THE JOB!"

REAR-DUMP EUCLIDS
CAPACITIES—15 to 30 ton payloads
POWER—150 to 275 h.p. diesel engines
SPEEDS—Up to 35.4 m.p.h. loaded

BOTTOM-DUMP EUCLIDS
CAPACITIES—13 to 50 cubic yard payloads
POWER—150 to 275 h.p. diesel engines
SPEEDS—Up to 32.6 m.p.h. loaded

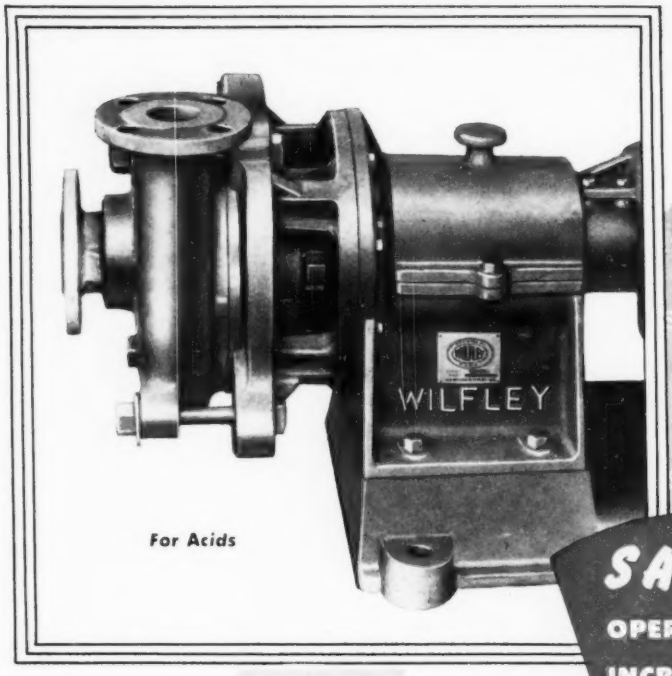
★ Men who know hauling equipment prefer Euclids. On mining and construction jobs the world over, you'll hear owners say, "Euclid is the best hauling equipment we've ever used". Operators, too, like "Eucs" because they have plenty of power and are easy to handle.

Euclids have earned their reputation for rugged staying power, low cost production and continuous operation on hundreds of tough jobs. From bumper to bumper every part is designed and constructed for long life in heavy duty off-the-highway hauling. The ability of Euclids to "keep coming back for more" is the reason why owners agree that Euclids really do the job.

The recommendations of a hauling equipment specialist are available without obligation—call or write your Euclid distributor.

THE EUCLID ROAD MACHINERY CO.
CLEVELAND 17, OHIO

EUCLIDS *Move the Earth*



For Acids

DEPENDABLE!

TROUBLE-FREE!

SAVE

OPERATING COSTS *with* INCREASED EFFICIENCY

A Companion to the Famous WILFLEY Sand Pump

•

Buy WILFLEY for Cost-Saving Performance

Every day, modern chemical plants all over the world are proving by actual experience that WILFLEY Acid Pumps effect a substantial saving in operating costs. These famous pumps handle acids, corrosives, hot liquids and mild abrasives on a trouble-free, 'round-the-clock schedule *without attention.* Exclusive features of design and construction make WILFLEY the dependable pump that delivers cost-reducing performance on every job. 10- to 2,000-G.P.M. capacities; 15- to 150-ft. heads and higher. Individual engineering on every application. Write or wire for specific information.

A. R. WILFLEY & SONS, INC.
DENVER, COLORADO, U.S.A.
NEW YORK OFFICE: 1775 Broadway, New York City

WILFLEY *Acid* PUMPS